SCIENCE

FEBRUARY 15, 1952

VOLUME 115 NUMBER 2981

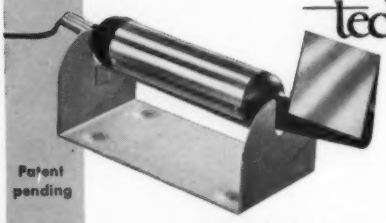
AAAS Proceedings Issue

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

technicon

"LAB-AID" EXPEDITERS

— they speed-up laboratory chores



Patent pending

110 Volts AC - DC
25 Watts

technicon paraffin knife

makes work with paraffin-embedded tissues quick and easy. Great for cutting large blocks into small ones; for mounting blocks on a microtome object disc; for squaring up blocks; for separating ribbons in a water bath . . . Hollow stainless steel handle doesn't heat up — easy to keep knife at the right temperature. When not in use lay knife in saddle rest—**Blade UP** indicates knife hot; **Blade DOWN**, knife cold.

Patent pending

5" wide
5" high
13½" long
110 Volts AC only
75 Watts

technicon microslide dryer

delivers slides ready for staining in *7 minutes!* Just drop slides, in an Autotechnicon Slide Carrier, into the hatch, flip the switch and close the cover. A steady current of warm, filtered air blowing over the slides carries away all moisture, leaving them bone-dry and dust-free. The filter is replaceable. There's no distortion, either — the warm clean air is well below the melting point of paraffin.

Patented

Size: 10¾" Diam; 3¾" High
Sturdy; durable; water and xylolproof finish.
110 Volts AC - DC

technicon *constant temperature* water bath

insures smooth, even spreading of your tissue ribbons. The water temperature is just right — never too hot or too cold, thermostatically held at any set temperature from 20° to 60°C. There's no melting paraffin to distort tissues — no folds or wrinkles, no bubbles due to frequent water change. Temperature stays constant, day-in, day-out. And it's easy to see your sections against the dull finished black interior of the bath.

technicon
LAB-AID REQUISITES

THE TECHNICON COMPANY
215 East 149th Street, New York 51, N. Y.

Send me literature and prices on

- ☐ **Technicon Paraffin Knife**
- ☐ **Technicon Microslide Dryer**
- ☐ **Technicon Constant Temperature Water Bath**

Name.....

Address.....

City, Zone, State.....

The Association's Journals

ALTHOUGH the current issue of SCIENCE is devoted to Association Affairs, it contains no reference to one aspect of AAAS business—the publication of SCIENCE and THE SCIENTIFIC MONTHLY. A brief summary of this important operation, specifically as it relates to circulation, will be attempted.

In 1951 the circulation of SCIENCE exceeded 33,000 for the first time, and that of THE SCIENTIFIC MONTHLY reached 25,098. For SCIENCE this was a modest gain of less than 700 for the year, but for THE SCIENTIFIC MONTHLY it registered a substantial increase—in excess of 2,000. For three successive years the monthly has gained three times as many new subscribers as the weekly, and the ratio of circulation has changed from 38:62 in 1947 to 43:57 in 1951.

The distribution among AAAS members in the several fields of science is both interesting and significant, as shown in an analysis made last May (Table 1). This table does not include nonmember subscriptions and exchanges, which run more heavily to SCIENCE. It discloses the fact that a much higher proportion of medical scientists, chemists, and biologists subscribe to SCIENCE than members in other fields, and perhaps it reveals why so many articles in these fields are received. Medicine, chemistry, and biology account for nearly two thirds of AAAS membership and over 61 per cent of SCIENCE's subscription list. Although the proportions of articles in the several sciences reflect a complex set of factors, numerical strength is a factor of prime importance. One of the questions constantly before the editors, the Editorial Board, and the Publications Committee is what constitutes a balanced journal. Is it one in which the several fields of science are equally served? Or is it one in which the articles reflect proportionately the specialized interests of subscribers?

The geographic distribution of SCIENCE has recently been analyzed (Table 2), and although it bears some relation to population and concentration of scientific institutions, discrepancies in these correlations are undoubtedly signicant; no interpretation will be attempted, however.

HOWARD A. MEYERHOFF
Chairman, Editorial Board

TABLE 1

Section	SCIENCE	THE SCIENTIFIC MONTHLY	Both journals	Neither journal	Totals
Mathematics	337	584	88	11	1060
Physics	1386	1335	351	14	3086
Chemistry	4867	3365	895	20	9147
Astronomy	130	170	29	3	332
Earth Sciences	611	1093	210	8	1922
Zoology	2955	1355	459	23	4792
Botany	1602	755	283	8	2648
Anthropology	129	231	43	2	405
Psychology	897	1210	194	12	2313
Social Sciences	185	504	55	3	747
History of Science	67	183	28	0	278
Engineering	815	1887	336	6	3044
Medicine	7253	2527	1652	24	11,456
Dentistry	206	232	81	1	520
Pharmacy	317	83	67	1	467
Agriculture	633	618	133	5	1389
Education	177	479	49	5	710
Industrial Science	12	15	28	1	54
Unclassified	286	360	292	5	943
TOTALS	22,905	16,986	5246	179	45,313

TABLE 2

New England	2373
Middle Atlantic (N. Y., N. J., Pa.)	8192
South Atlantic (Del. to Fla.)	4000
East North Central (Ohio to Wis.)	5780
East South Central (Ky., Tenn., Ala., Miss.)	906
West North Central	2078
West South Central	1524
Mountain states	849
Pacific states	3375
Territorial	250
Foreign and miscellaneous	4002
TOTAL	33,329

SCIENCE, founded in 1880, is published each Friday by the American Association for the Advancement of Science at the Business Press, 10 McGovern Ave., Lancaster, Pa. Entered as second-class matter at the Post Office at Lancaster, Pa., January 13, 1948, under the Act of March 3, 1879. Acceptance for mailing at the special rate postage provided for in the Act of February 28, 1925, embodied in Paragraph (d-2) Section 34.40 P. L. & R. of 1948.

All correspondence should be sent to SCIENCE, 1515 Massachusetts Ave., N.W., Washington 5, D. C. The AAAS assumes no responsibility for the safety of manuscripts or for the opinions expressed by contributors. Four weeks' notice is required for change of address, and an address stencil label from a recent issue must be furnished. Claims for a missing number will be allowed only if received within 60 days from date of issue.

Annual subscriptions, $7.50; single copies, $.25; foreign postage, outside the Pan-American Union, $1.00; Canadian postage, $.50. Special rates to members of the AAAS.

The AAAS also publishes THE SCIENTIFIC MONTHLY. Subscription and advertising rates on request.

REAL RECORDING VERSATILITY

Your choice of 1-, 2-, or 4- channel systems — each with all the advantages that the famous name "Sanborn Viso" denotes

VISO-CARDIETTE

While designed primarily as a direct-writing clinical electrocardiograph that can quickly record *all* accepted leads, this oldest member of the "Viso family" will also register *many other* phenomena, using suitable supplementary equipment. Its proven recording principles provide the basis for the design of the 1-, 2-, and 4-channel systems below. These instruments feature standard "Viso" advantages: immediately visible, permanent records traced by heated stylus (no ink) on plastic coated, continuous chart paper; recording in *true* rectangular coordinates; *independent* timing; and simplified control. The recording paper speed of Viso-Cardiette is 25 mm/sec. Paper width is 6 cm with a 5 cm recording area.

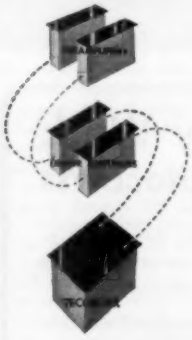
INTERCHANGEABILITY of Preamplifiers and Amplifiers permits recording of many different types of phenomena.

VISO RECORDER (SINGLE CHANNEL)

A simple and *lower cost* means of securing all the recording advantages of the Viso-Cardiette (described above), when electrocardiography is not a requirement, is offered in this assembly. The system comprises a single-channel recording unit, patterned closely after that of the Viso-Cardiette, and assembled in one case with *either* a General Purpose or Strain Gage Amplifier which are *interchangeable* as described at the left.

TWIN-VISO CARDIETTE (TWO-CHANNEL)

The two channels of the Twin-Viso operate independently of each other, but register simultaneously on one Permapaper record. Or, one channel may be used alone, with 1-channel recording Permapaper. A standard, "built-in" feature of the Twin-Viso is a choice of *ten* paper speeds which may be selected at will by the operator thru a quick and simple interchanging of sets of gears. These speeds are in pairs of 5 and 0.5, 10 and 1, 25 and 2.5, 50 and 5, and 100 and 10 mm/sec. Either speed of any pair selectable at will by panel control. Standard "Viso" recording advantages (described above) are inherent in the Twin-Viso and the Poly-Viso Cardiettes, and to them is added manually or remotely controlled code marking.



Any of the recording channels in the three systems at the right may include *either* a Strain Gage or General Purpose Amplifier, or the latter in combination (in 2-, and 4-channel systems) with either AC or DC Preamplifiers. For, any of the Amplifiers or Preamplifiers provided for in a system may be quickly *removed* from its place in the system and as quickly *replaced* with an alternate type.

POLY-VISO CARDIETTE (FOUR-CHANNEL)

This multi-channel research recorder provides for one-, two-, three-, or four-channel registrations on one record, using Permapaper of appropriate widths. The Poly-Viso operates under the same principles as the Viso- and Twin-Viso Cardiettes described above and offers a "built-in" choice of eight paper speeds: 50, 25, 10, 5, 2.5, 1.0, 0.5, and 0.25 mm/sec., *all* selectable by panel control.

RECORDERS AND AMPLIFIERS ARE AVAILABLE SEPARATELY

The Recorders, Amplifiers and Preamplifiers of which the above complete systems are comprised may be obtained *separately*, to be combined or integrated by the user with other equipment.

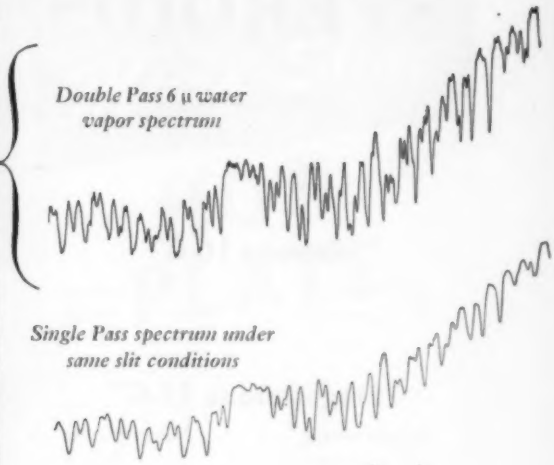
For descriptive literature or information of any kind about this equipment, address

SANBORN CO.

CAMBRIDGE 39 MASSACHUSETTS

ANNOUNCING... *A New Principle in Infrared Spectrometry*

The Perkin-Elmer Model 112 Double Pass Infrared Spectrometer



The Double Pass Infrared Spectrometer permits performance hitherto unobtainable in small prism instruments

The Model 112 Perkin-Elmer Infrared Spectrometer incorporates the new Model 99 Double Pass Monochromator, permitting double monochromator performance with a *single* optical system. By passing radiation twice through the same optical system, double monochromator performance is achieved with a minimum of mechanical complexity and at a cost comparable to single monochromator instruments.

Improved performance characteristics are shown in the 6 μ water vapor absorption spectra above, and in the performance data below. In the Model 112 Infrared Spectrometer, ultimate resolution is doubled, energy per spectral slit width is 50 percent higher, and scattered radiation is less than 0.1 percent throughout the range.

The Model 112 is otherwise similar to the well-known Perkin-Elmer Model 12-C Infrared Spectrometer. All Model 12-C accessories are usable with the Model 112. Existing Model 12's may be converted to double pass operation.

Write for Bulletin 102 containing a complete description of Model 112.

FEATURES

Resolution: Better than 2.0 cm^{-1} with suitable prisms.

Scattered Radiation: Less than 0.1 percent throughout the range.

Range: 1-40 microns (with suitable prisms). May be used in visible and ultraviolet with special attachments which can be provided.

Mobile Mounting: The instrument may be supplied in a metal console, mounted on casters, for operation wherever power and water are available.

THE PERKIN-ELMER CORPORATION
NORWALK, CONNECTICUT

Leading manufacturers of Infrared Spectrometers, Continuous Infrared Analyzer, Double Pass Monochromator, Flame Photom-

Large Capacity Centrifuges

Designed for large capacity centrifuging in the Chemical, Biological and Pharmaceutical industries, or wherever a batch type Centrifuge is required to handle large volumes of material in bottles or sealed containers. Several Models are available according to capacity requirements.

Model 13L - Spins 10 one liter bottles at 2300 r.p.m. (2280xg.) — or 10 1.3 liter spun aluminum containers at the same speed. A water-cooled enclosing guard and windshielded head minimize heating of contents during centrifuging.

MODEL FS

MODEL 13L

Model FS - Spins 4 one liter bottles or six half-liter bottles at 2500 r.p.m. (2000xg.). Adapters are available for smaller tubes and bottles. Perforated basket style heads are also available 14″ in diameter x 6½″ deep in manganese bronze and stainless steel, speed 2500 r.p.m. (1250xg.). This Centrifuge can be furnished with explosion-proof motor and mechanical speed controller for hazardous locations.

Model SR-3 - Identical in speed and capacity to Model FS listed above, but refrigerated, so that controlled temperatures to 0° C or lower may be maintained within the Centrifuge guard during the centrifuging process.

Note: *A smaller capacity, higher speed Refrigerated Centrifuge, Model PR-1, is also available.*

Prompt delivery on all Models. Write today for descriptive Bulletins 13L, FS and RC, containing complete details and current prices.

Makers of Fine Centrifuges for Fifty Years

INTERNATIONAL EQUIPMENT COMPANY

1284 SOLDIERS FIELD ROAD, BOSTON 35, MASS.

Man's Synthetic Future[1]

Roger Adams

Department of Chemistry, University of Illinois, Urbana

THE PRESENT UNCERTAINTIES facing the peoples of the world, and the startling discoveries in science during the past few decades, have stimulated many to prognosticate about the future. Numerous and various forecasts have been made as to national groupings, forms of government, celestial transportation, sources of food, new building materials, and modes of living. Some predict communization of the world, others that there will be internal revolutions against Communism and Fascism, bringing about the return of freedom of speech and action to all people.

William J. Hale forecast the gradual regroupings of nations into four units, each of which will embrace peoples of more or less the same biological traits, but which will not be influenced by common languages and customs. The groupings will be based on physical, chemical, and biological considerations in areas which never lack self-sufficiency of any type. The smaller nations, technologically unsuited to a future in a strictly chemical world, would have to be grouped with the greater powers, which through two centuries have shown an innate ability to advance against all opposition.

The line may not yet be forming for the first trip to the planets, but the Hayden Planetarium of the American Museum of Natural History is accepting reservations for the first interplanetary flights. The rough timetable assumes rocket ships that will reach the moon in nine and one-half hours, Mars in 75 days, and Jupiter in 666 days. This may lead to new terms in timetables when a trip is almost two years in duration. The dining compartments will necessarily be enormous in size, even if food concentrates are used, and even if it be assumed that people will require less food under gravity-free conditions. Perhaps there will be celestially anchored hot-dog stands along the way.

Some rocket engineers have boldly predicted space flights within the next decade. Many, many decades seem more likely before rocket ships will be built that will accelerate to the 25,000 miles per hour required to escape from the earth's gravity. Moreover, it is still to be determined what will happen to body functions under gravity-free conditions, and how human beings may be protected in an oxygenized, pressurized ship when the body has no weight and one can lift a sledge hammer quite as easily as a pencil. These illusions are no more astounding in our day than those of one hundred years ago when, in *Darius Green and His Flying Machine,*

> Darius was clearly of the opinion
> That the air is also man's dominion,

and J. H. Yates wrote,

> I have seen so much on my pilgrimages through my threescore years and ten
> That I wouldn't be surprised to see a railroad in the air,
> Or a Yankee in a flyin' ship a-goin' most anywhere.

Predictions of this sort do not fall within the purview of the chemist, but there is a rapidly growing number of science-fiction writers who are creating fanciful plots that may someday come true.

My remarks will be based on projecting the chemical discoveries of the past to logical achievements in the future. One hundred years ago, all materials used by man were derived directly from natural sources—plants, animals, and minerals. The chemist has, through the past six decades, so perfected his knowledge of the intricacies of molecules through physical and chemical methods that he is now able to determine the patterns in which the atoms are combined in nature's substances. Indeed he is able to assemble atoms according to his own design and thus produce many of these same substances by synthesis. Moreover, he has discovered how to create new, better, and cheaper compounds based on a knowledge of natural products.

One of the first industries transformed by chemistry was dye manufacturing, an industry that is now 99 per cent synthetic. In a second field, drugs and medicinals are over 75 per cent of synthetic origin. Natural gums and resins at present account for only 5 per cent of the 2.3 billion pounds of plastics produced in the United States last year. More than half the 500 million gallons of paint used annually are based on synthetic products. Over 50 per cent of today's rubber is synthetic, and over 20 per cent of the textiles. The field of synthetic detergents has had a phenomenal growth, until more than one billion pounds are produced annually. This figure is still well below the amount of soap consumed.

During World War I we became conscious of shortages of raw and finished materials, especially chemicals; of shortages of certain foods and of the necessity for substitutes. During World War II, and now

[1] Based on the address of the Retiring President, delivered at the Annual Meeting of the American Association for the Advancement of Science, December 28, Philadelphia, Pa.

during the rearmament period, the shortages are primarily in raw materials. We normally consider that the United States has abundant resources, yet the government lists 167 strategic items that must be imported. Stockpiling by the government of materials essential to both war and peace, but not indigenous to the U. S. or found here in less than the required quantities, has resulted in artificial price increases.

Let us consider for a moment our mineral supplies. The most widely distributed metals are iron, aluminum, magnesium, and titanium. They are available in amounts sufficient to supply the world's needs for hundreds of years. Aluminum and its alloys will continue to replace steel and other metals in even larger measure than in recent years. Magnesium, a very light metal, has found many uses, especially in alloys, but certain of its properties would appear to limit its extensive industrial application. Titanium, about which much has been heard in recent months, is fourth in abundance of all metals, and its ores are widespread over the world. It is truly the metal with an attractive future. Only half as heavy as steel, it is, in a pure state, ductile, very significantly heat- and chemical-resistant, and readily forms valuable alloys. It does not corrode even in sea water. For jet engines it is ideal. Its applications would be exceedingly numerous were it not for the cost. Titanium dioxide, a common derivative, which can be obtained readily from the native ore, is familiar as a superior white pigment for outdoor house paints and in finely divided form as a delustrant for rayon and nylon. The cheap production of pure titanium metal, however, has baffled the efforts of chemists and metallurgists for years. The annual supply of the metal has been only a few hundred tons, and it has sold at a price of $10.00–$20.00 or more per pound, thus restricting its use to items where properties are all important and cost is a small factor. But now the government is supporting the construction of plants that will provide an annual production of several thousand tons to be used primarily for military purposes. The cost of production, even on the larger scale contemplated, is likely to bring the price down to not less than $5.00 a pound, a figure much too high for general industrial application. One of the liveliest chemical problems today is the attempt to discover a cheaper way of obtaining pure titanium metal from its ores. When solved, several of the metals now considered so essential for certain steels and alloys will be in less demand.

Proved mineral deposits of all ores of less common metals, such as copper, lead, zinc, manganese, chromium, tungsten, tin, and others, would appear to have a limited life. There is, however, still much territory on earth that has not been prospected, and there still exists the possibility of mineral deposits being found deep in the earth or under lakes and seas. It has been reported that under the lakes in central Finland rich bodies of ore have recently been discovered. Perhaps the future supplies are underwater or in the frozen regions of the poles.

There is a fantastically large source of chemicals hardly touched at present in sea water. The amounts of chemicals in sea water have from time to time been published, but I venture to repeat them. A cubic mile of sea water contains 143,000,000 tons of sodium chloride, more than 300,000 tons of bromine, and over 5,000,000 tons of magnesium. A host of other metals are present in lesser amounts. When it is considered that there are over 3,000,000,000 cubic miles of sea water, the potential supply of metals and salts is staggering. At present, sea water is a source of salt in some countries and an economic source of magnesium and bromine in the United States. The future chemist and engineer will discover a practical method of recovering many of the other minerals for commercial use. Paraphrasing Longfellow—

> Would'st thou, so the chemist questioned,
> Learn the secret of the seas?
> Only those who're trained in science
> Divine the possibilities.

The use of petroleum and natural gas for fuels, and more recently as raw materials for strategic organic chemicals, has been stupendous. During the past twenty-five years, the consumption of petroleum has increased, on the average, 4 per cent a year and of natural gas 10 per cent a year. The present demand for petroleum has reached a level of 2 billion barrels a year, 30 per cent of which is employed in the manufacture of several thousand organic chemicals. The demand for natural gas is 7 billion cubic feet annually, 10 per cent of which is consumed in the chemical industry.

As of January 1951, proved reserves of petroleum had been established which, on the basis of present annual consumption, would last for fifteen years and those of natural gas twenty-six to twenty-seven years. More significant, however, is the fact that in spite of the continuous increased consumption of these products the 1951 reserves substantially exceeded those of 1950. Exhaustion of supplies has been predicted periodically for three decades, but still new reserves continue to be discovered, although with greater difficulty and at increased expense. Even if the supply in the United States decreases more rapidly than elsewhere, the reserves in foreign lands will be adequate for a long time. From 1859 to 1951, almost a century, about 41 billion barrels of oil have been produced. All this would not fill a space 1.6 cubic miles in volume. This is insignificant in relation to the total volume of oil likely still to be found in the world.

But even when the petroleum is exhausted, huge reserves of coal, oil shale, and lignite are available. By appropriate processing, the study of which is well advanced if not yet perfected, these may be converted into gasoline and related products. On the basis of present consumption, coal, oil shale, and lignite reserves would last 700 or 800 years, but allowing for difficulties of recovery and for increased demand it would appear conservative to estimate they will last for at least 200–300 years. I am willing to prophesy

that when the time of exhaustion arrives scientists will have found substitutes.

Petroleum, originally a source merely of kerosene, then of gasoline and lubricating oil, has become, along with natural gas, the raw material for a host of aliphatic and aromatic chemicals upon which many of our chemical industries are founded. The magnitude can be realized best by citing that 1.25 billion pounds of butadiene, obtained by an appropriate cracking process from petroleum, are used annually for 825,000 tons of synthetic rubber. From 3,500,000,000 pounds of ethylene, propylene, butylene, and isobutylene, 16,000,000,000 pounds of derivatives are made each year. Just a decade or two ago the chemical industry relied upon coal tar, the volatile liquids obtained when coal is coked, for many of its raw materials. But with increased use of petroleum for power, and of natural gas for heating, less coal is being coked and the supply of chemicals from the coal tar is much smaller than the demand. Industry has now turned to petroleum for a substantial proportion of its chemicals for the synthesis of dyes, drugs, plastics, and fibers.

Rapid mechanization has made search for substances to produce energy as well as heat one of our prime objectives. A hundred years ago, it was wood, and now fossil fuels have the attention of a multitude of technologists. It is difficult to conceive of modern life without power and heat. In spite of the discovery from year to year of more reserves of energy-containing materials, the time before these are exhausted is at most a matter of a few hundred years and then a new source of energy must be available.

A perpetual supply of energy comes from the sun. How vast it is compared to the energy-supplying materials on earth may be realized by a comparison presented in an article by Eugene Ayres. Suppose that all the coal, lignite, peat, tar sands, crude petroleum, natural gas, and oil shale that we are likely to produce in the future on the basis of the most optimistic estimates were collected. Suppose that all the timber of the world were cut into cordwood. Moreover, suppose that all the uranium and thorium that are likely ever to be discovered were purified and made ready for nuclear fission. Suppose now that this fuel were distributed over the face of the earth, that the sun were suddenly extinguished, and that the fuel were ignited to give energy at the rate at which we are accustomed to receive it from the sun—the combustible fuel would be gone in three days. Nuclear reactions would last a few hours. The energy that actually reaches the earth from the sun is over 30,000 times that of all the fuel and water power now used. There just isn't anything that can be a competitor of the sun. It is fortunate we shall continue to have plenty of solar energy, which, directly or indirectly, serves to keep the world an attractive place in which to live.

Of the annual land vegetation, only 14 per cent is consumed as food, fuel, lumber, paper, and chemicals. The balance of 86 per cent is returned to the earth to maintain essential biological balance. With our ever-increasing population, it is doubtful whether the fuel use of vegetation can be increased to any very great extent.

Sooner or later the inexhaustible supply of energy from the sun will be used to supplement, or in large measure to replace, energy-containing materials on earth. Only limited progress has so far been made. Of the scientists' approaches for collecting the sun's energy several have shown some promise. A popular study has been that of the single-celled alga *Chlorella pyrenoidosa*. This plant multiplies at a rate that appears to be limited only by the carbon dioxide content of the water. Carbon dioxide in the air amounts to 0.03 per cent. It has been found that algae in pans of water six inches deep are capable of absorbing up to 2 per cent of the total solar energy falling on a given area as compared with less than 0.1 per cent for average agriculture. A yield of 15 dry tons per acre has been realized, which is nearly five times that of the best land growth, and scientists believe that this yield can be trebled. The Carnegie Institution has recently reported what is claimed to be the first large-scale experiments with *Chlorella*. Whether these algae may be used directly for cattle or human food, or whether they may be converted more profitably into chemicals or fuel is a problem for the future. To provide 1 billion barrels of motor fuel from algae would require an area of 35,000 square miles, assuming 35 dry tons of algae per acre could be obtained.

Photosynthesis, the process by which all vegetation is created, is not well understood. In essence, the plant converts the low-energy compounds, carbon dioxide and water, to carbohydrates and oxygen in the presence of chlorophyll. Attempts have been made to replace chlorophyll by synthetic dyes and inorganic chemicals. It has been reported that from certain experiments an amount of energy is absorbed equivalent to that absorbed in the presence of chlorophyll.

The use of glass, sometimes with reflectors, to collect the heat from the sun shows promise of becoming practical. Energy absorption seven times as efficient as the most optimistic agricultural proposals has been claimed. Apparatus is now in use for the heating of water by the sun.

Phosphors are chemicals that absorb radiant energy and radiate it after a certain length of time. Such chemicals might be employed to absorb energy from the sun during the day and for illuminating purposes at night. Even though inefficient in this process of absorption and emission, the amount of the sun's available energy is so great that this procedure is not beyond the realm of practical possibility.

New sources of energy, however important they may be, are not an immediate problem but one for future generations of chemists and engineers. With our present adequate raw materials, let us explore what discoveries may be expected. "Synthetic polymers" is a term used by the chemist for the giant molecules he has learned how to manufacture from very simple

ones. Such polymers possess very different physical properties and relatively inert chemical properties compared to the substances from which they are derived. Synthetic rubber, plastics, resins, and fibers fall into this category.

Today's synthetic rubber is the equivalent of natural rubber when fabricated into tires for passenger automobiles. Many improvements in the processing of synthetic rubber for tires have been made in the past decade, the most interesting of which has been recent—the incorporation of a substantial amount of petroleum in the mix. The resulting tires are claimed to have no inferior qualities, and some superior ones, to those that are oil-free. Moreover, they can be made more cheaply, and a substantial amount of raw rubber is conserved. A synthetic rubber suitable for heavy-duty tires on trucks, buses, and other large vehicles has yet to be found. Present synthetic rubber tires when used for this purpose are susceptible to a heat build-up that leads to excessive degradation. The eventual discovery of a synthetic rubber for this purpose is merely a matter of time. Moreover, special rubbers, capable of withstanding the cold of the Arctic and the heat of the equatorial desert regions without losing the required elasticity, and those which are oil-resistant and suited for low-temperature utilization, will be added to the list.

Dozens of various kinds of plastics are now sold commercially. These vary from the clear and transparent, especially suitable for ornamental purposes or for airplane windshields, to very tough, chemical- and heat-resistant plastics for use as gaskets in chemical operations involving corrosive materials. There are resins and plastics for parts of chemical equipment; for coatings of wire to be used in the construction of small motors operating at high temperatures to produce the power of an ordinary larger motor; for the waterproofing of fabrics; for finishes of wood, metals, and even stoneware. Plastics are available for all types of bristles, and others are suitable for replacement of metals even where strength is a primary factor. The future will see transparent plastics that will not discolor and with surfaces that will not craze or scratch readily; finishes for wood and metals that will remain durable for long periods of time in the presence of sunlight and salt air; and flexible, water- and moistureproof film of any desired strength.

Cotton, silk, and wool have been the fibers used almost exclusively for fabrics until a few decades ago. Rayon and acetate silk were then introduced. These are both chemical modifications of cellulose, derived usually from cotton or wood. In spite of the fact that they lack many of the desirable properties of the natural fibers, particularly wet-strength and recoverability of the original shape upon drying, these fibers have been widely accepted and have supplemented or in part replaced cotton and silk. Acetate fabric possesses a luxurious "feel" and drapes in soft, lustrous folds. Acetate blends remarkably well with other fibers. Just recently it has been announced that a rayon has been made in which the basic structure has been so modified that the resulting product has the wet-strength exhibited by natural fibers. If this is authentic, one of the greatest steps forward in rayon manufacture since its inception will have been achieved.

About fifteen years ago nylon, a strictly synthetic fiber, made by combining very simple molecules into a complex one similar to those nature furnishes us, made its appearance. Chiefly because of its rapid-drying properties, its durability, and its resistance to fungi and insects, it has found many applications for which natural fibers are not suitable. Natural silk, for which nylon is a substitute, has never recovered its prewar status. The brilliant researches in Japan extending over a period of forty years, when the silkworm was nurtured and pampered until he produced an egg-shaped instead of peanut-shaped cocoon with a filament twice as long as formerly and of double strength, will be of no avail by the time the synthetic chemist has had a decade or more of additional experience. The uses for nylon have become so numerous that the demand cannot be met by present production facilities. Newer synthetic fibers have appeared on the market—for example, Orlon, Acrilan, Dynel, which resemble one another somewhat in properties and are all based on the same simple chemical, acrylonitrile. These fabrics are utilized particularly for seat covers, curtains, and filter cloths in industry. They are also suitable in the apparel field because of their smart appearance, long wear, and easy laundering. Still another synthetic fiber is Dacron, which resists wrinkling, water, and moths as does no other fiber. Suits made of Dacron go through rainstorms without losing their crease, and can be cleaned with soap and water without losing the original shape after drying.

Rapid drying is effected because the threads or fabric do not absorb water, and drying consists merely in the evaporation of surface moisture. But this nonabsorption of moisture leads to a certain amount of discomfort, particularly in hot weather. Consequently, closely woven fabrics for shirts and undergarments have in large measure been replaced by those with a sheer or open weave. To find a fiber that will dry rapidly and at the same time permit moisture to penetrate is asking more than the chemist is likely to discover, since they are two incompatible properties. But these synthetic fibers must be improved in other ways, or new fibers found which have the desired properties, before natural fibers will be extensively replaced. The present synthetic fibers do not take dyes as effectively as natural fibers, and up to the present it has been impossible to manufacture fabrics with the attractive colors so frequently found in silk and wool. Synthetic fibers also have the annoying property of melting or changing color if the pressing iron is too hot. The "feel" of synthetic textiles has been improved, but the resiliency of wool or the warm, soft "feel" of silk has not yet been duplicated in the synthetics. When, however, synthetic fibers are blended with wool or rayon

in various proportions, fabrics with many of the desirable properties of each of the components have been obtained.

Certain representatives of the petroleum industry, when called upon to make speeches in foreign lands on the progress of petroleum chemistry, have demonstrated the achievements by clothing themselves completely—suit, necktie, shirt, underclothing, and socks—with synthetic fibers, the primary chemicals for which are all are derived from petroleum. For any traveler in foreign lands, the convenience of synthetic fiber wearing apparel is superlative.

I predict the discovery of synthetic fibers which the public will prefer for most purposes to the natural fibers. An official of the wool industry made a statement recently that the demand for wool as a fabric will never be replaced. These words were spoken by one completely unfamiliar with the potentialities of chemical research. Just as the automobile replaced the wagon, synthetic fibers will replace the natural fibers. Half the wool now consumed will be replaced by synthetic fibers within ten to twenty years, the time being dependent primarily on the restrictions which industry encounters in materials and money for plant construction. Synthetic fibers to replace cotton will also be discovered; these will be strong, durable, and moisture-absorbing, thus making them suitable and comfortable for wearing apparel. They will not, however, be rapid-drying.

The plastics to replace cotton will also serve to replace natural leather for shoe uppers. For years excellent leather substitutes, especially for seat coverings and bookbinding, have been available but not for shoes. Natural leather permits moisture to penetrate, and the feet remain dry except when it is unusually hot. The present artificial leathers do not have this property. As a consequence, when shoes of this material are worn the feet become moist and uncomfortable. With durable, moisture-absorbing plastics, the problem of synthetic shoe uppers will be solved.

Plant life is essential to human existence, and the chemist will contribute much in this field. By well-known processes of selection and plant breeding, the agriculturist has succeeded, during the forty years that soybeans have been grown in this country, in increasing the oil content from 16 or 17 per cent to 21 or 22 per cent. Hybrid seed corn, which is now widely used by farmers, results in an increase in crop yield sometimes as high as 50 per cent, essentially without any additional requirements in the soil. The inference from these achievements is that proper chemical treatment of plants could result in fundamental modification of their metabolism. By standard agricultural development methods the future will see food crops in which the size of the plant is dwarfed and the fruit, kernels, or ears of corn of greater size. In this way, more plants can be grown in a given area and the subsequent crop will be larger.

Another means of providing a greater crop from a given acreage is by plant-growth stimulants—chemicals that accelerate the growth and maturation of plants. Several are known, and chemists will discover new and better ones, with the eventual result that two crops of the same or different plants may be grown during the normal season where now only one crop is possible. Perhaps during these experiments we may find substances that will not merely speed up the growth of a plant but cause its fruit to be larger—for example, pears, apples, or oranges the size of grapefruit. If this seems fantastic, just consider the coconut milk factor recently discovered in academic experiments. On its addition to a basal nutrient agar medium, mature plant cells are caused to subdivide; for example, cylindrical slices of carrot will grow rapidly.

Plant physiology is still in its infancy, and it must be better understood before rapid advancement in the cultivation and control of plants can reach a maximum. Experiments performed in Germany during the past ten years permit one to envisage remarkable achievements in the future. In the flowers of the forsythia, those early yellow blooms which decorate gardens in many parts of the country in the early spring, it has been observed that the pollen of one flower never fertilizes the stigma of the same flower, nor does it fertilize a flower of the same type whether the flower is on the same or another bush. Formation of seed occurs in flowers where the pollen comes from long stamens and is accepted by flowers with long stigmas. Similarly, pollen from flowers with short stamens fertilizes flowers with short stigmas. Other combinations result in nonfertilization. A chemical study of pollen from long and short stamens has revealed that, although closely related chemicals are in each, they are actually different. With this discovery, a procedure was developed whereby fertilization of these flowers could be made to occur by chemical treatment where it would not have occurred naturally.

Not too remote from these experiments is that of spraying the blossoms of tomato plants with 2,4-D, a chemical commonly used for killing broad-leaved plants. This not only causes many more of the earlier blooms to mature into fruit, but the tomatoes formed are seedless. With this start, let us look forward to seedless raspberries, blackberries, cranberries, and perhaps many other kinds of fruits, such as watermelons, pears, and apples.

One of the banes of the farmer or the florist is the insect pests that either destroy or greatly reduce his crops. The varieties of insects and mites are many, and consequently different kinds of chemicals have been sought to eliminate them. DDT is effective in the killing of flies, mosquitoes, and many insects that attack plants, but it is not universally good. Several other insecticides are available, each with its special properties for use on a certain type of insect. Periodic spraying of crops, however, is not only expensive but inefficient, since it is impossible to reach all parts of the plant. The chemist must search for a more ideal insecticide. The ultimate will be a chemical, repellent

to all insects and mites and innocuous to plants and to higher animals, a substance which when sprayed on the leaves will be absorbed and completely translocated by means of the plant juices. Why not seek also a combination of minerals and fertilizer required as plant food that can be absorbed through the leaves rather than to follow the traditional custom of fertilizing the soil with chemicals, a large proportion of which is washed away by the rain before plant absorption has occurred?

The farmer also requires chemicals to control weeds and to simplify his cultivation problems. Rapid advances have been made in this area, and many chemicals are known that are toxic to certain kinds of vegetation. Chemicals will sometime be available to sterilize the soil completely toward grasses and weeds but not toward the desired crop. Because of the similarity of many plants to each other, it may be necessary to provide a series of chemicals, each of which will effectively kill just one kind of several closely related plants. The layman will welcome the day when he can effectively kill the crab grass in his bluegrass lawn.

Far more important information will eventually result from the study of plants. Each plant, with the aid of the sun's energy, converts carbon dioxide and water in presence of mineral salts into a wide variety of chemicals, such as starch, cellulose, protein, vegetable oils, chlorophyll, and many other complex organic molecules in smaller amounts. These reactions take place at ordinary temperatures under very mild conditions, commonly known as "biological conditions." In comparison, the chemist is a clumsy operator. He requires massive equipment, often high temperatures and pressures, skillful engineering, and a number of operations to achieve what the plant does with a little sunlight and the simplest of chemicals. The chemist has discovered a few reactions that take place under very mild conditions and result in the formation of complex molecules from several simple ones. But he is a long way from understanding how nature operates. When, a few centuries hence, such reactions can be duplicated in the laboratory our present production methods for many organic chemicals, ingenious and skillful as they now appear, will look archaic.

Characteristic of each plant is its ability always to build up the same chemicals year after year. It has been observed, however, that if a plant is moved to a different climate the relative amounts of the chemicals present may often be modified. The day will come when a plant, after treatment with a certain chemical, will be inhibited from synthesizing one or more of the substances normally found within its structure or, on the other hand, the plant may be stimulated to create one or more of its chemicals in much larger amounts. Thus fodder crops might result from plants which now contain some toxic constituent, or plants which contain physiologically active medicinal substances may be induced to produce them in larger quantities.

The present food supply of the world, if properly distributed, would be adequate. With the steady increase in population, sooner or later all the arable land will be utilized, and even intensive farming of the soil through improved agricultural methods, plant stimulants, weed-controlling agents, pesticides, and other developments will not meet the world's food requirements. The resources of the sea will then be more intensively exploited than at present. Fish is a valuable food of high protein and rich vitamin content. It can be expanded to supplement meat supply. I envisage a more systematic fishing industry than at present—certain types of fish ranches—large fenced-off water areas in which fish are grown, fed, and annually harvested—analogous to cattle ranches.

Sea farming will be a term comparable to land farming. Marine plants for food, fuel, or chemical use will be grown and harvested like land crops instead of the present system of collecting what happens to be washed ashore. When, with these extensions, the food supplies reach the limit the chemist will provide antifertility compounds which upon addition to the diet will assure a means of controlling the birth rate.

The diets of humans have been improved until now many ailments resulting from diet deficiencies are well understood and have largely been overcome either by balancing or supplementing the food intake. Concentrated or synthetic foods containing just the necessary constituents for human growth and development are feasible, but they will never be accepted by persons in good health as long as eating attractive food is the most general and universally liked human activity. In spite of properly adjusted diets, the human race is susceptible to a long list of bacterial, virus, fungus, and degenerative diseases, some of which have thus far resisted the efforts of science.

Until half a century ago, medicinal products for treatment of disease were confined chiefly to plant or animal extracts or principles discovered originally through the cut-and-try methods of the physicians of earlier ages. The chemist has now synthesized many of these principles and on the basis of this knowledge has been able to produce other products superior to the natural. Drugs that have not been derived from the basic information provided by nature have been fortuitous or have been discovered usually by serendipity, a combination of skillful observation and chance that leads so often during scientific research to unexpected achievements of basic or applied importance.

Even though a marvelous array of drugs is now available, and a vast storehouse of information has been collected, the laws of chemotherapy are still unrevealed and decades will pass before a rational chemical basis will be provided for discovery of new therapeutic agents. The knowledge of the living cell in which the chemical reactions are constantly occurring to provide the life process is still very meager. However, the elaborate series and combinations of reactions in the cell are gradually being untangled. The

cell functions in health and disease will sooner or later be clarified.

While these more basic explorations are progressing, search for more effective drugs by present procedures will be intensified. New and better drugs for combatting bacterial diseases may be expected. I envisage the gradual replacement of the drugs which must be administered intravenously or intramuscularly by others of equal or greater potency which may be taken orally. Many of the most stubborn diseases of mankind are those caused by viruses, such as the common cold, poliomyelitis, spinal meningitis, influenza, virus pneumonia, mumps, and measles. Satisfactory drugs for their treatment are lacking. The retarded progress in this field in contrast to that made in the study of bacterial diseases is the result of the absence of suitable laboratory or animal assay methods for determining the effectiveness of any chemical agent upon a particular virus. Bacteria can be grown in the laboratory, but viruses propagate only within living bacteria or living cells. Research in the next decades will solve the vexing problem of finding viricides, and thus open a new chapter in medical therapy.

For the degenerative diseases, such as cancer, heart disease, or arteriosclerosis, it is unlikely that complete cures can be found, but the organic chemist will succeed in providing products that will eliminate susceptibility toward these diseases.

As the physiology of the cell becomes better known, and the relation of chemical structure to cell and tissue is revealed, chemically induced mutation of cells may become possible. Certain hormones and other drugs are now known which affect the physical being as well as the mental attitude of an individual. The future may bring to us a series of drugs that will permit deliberate molding of a person, mentally and physically. When this day arrives the problems of control of such chemicals will be of concern to all. They would present dire potentialities in the hands of an unscrupulous dictator.

What may we expect from atomic energy and radioactive substances? The ores of uranium and thorium are found in only limited quantities on this earth. The industrial applications of atomic energy are, therefore, likely to be limited to special situations, such as submarine propulsion or power units to be used in isolated spots, inaccessible to the ordinary energy-bearing materials. Radioactive substances will continue to find more and more utilization in elucidation of organic and physiological reactions, particularly metabolic degradations and transformations. Whereas biochemical studies will probably lead to compounds which may go far toward the prevention of cancer, the newer α-, β-, and γ-radiations from radioisotopes are likely to be found more effective for reducing or arresting growth of certain types of tumors than the older radium radiation. Promising results have been obtained by introducing such a substance as radioactive gold directly by mechanical means into certain tumors. In the diagnostic field many applications of radioactive substances may be anticipated. Thus it is now possible to demonstrate the presence of a tumor in the brain, and even to localize it accurately from outside the skull by means of certain radioactive iodine-tagged chemicals.

In 1780, Benjamin Franklin, in a letter to Joseph Priestley, wrote as follows:

> The rapid progress true science now makes, occasions my regretting sometimes that I was born so soon. It is impossible to imagine the height to which may be carried, in a thousand years, the power of man over matter. We may perhaps learn to deprive large masses of their gravity, and give them absolute levity, for the sake of easy transport. Agriculture may diminish its labor and double its produce; all diseases may be by sure means prevented or cured, not excepting even that of age, and our lives lengthened at pleasure even beyond the antediluvian standard. O that moral science were in a fair way of improvement, that men would cease to be wolves to one another, and that human beings would at length learn what they now improperly call humanity.

Let us see what has happened during the 170 years since this was written. We do not know yet how to eliminate gravity so as to facilitate transport. In agriculture, however, Franklin's predictions have already come true. When this country was founded, it took nine people on the farm to feed themselves plus one city dweller. Today, in contrast, one man on the farm feeds himself, four city people, and one person overseas.

There can be no complaint about the achievements in treatment of many diseases by use of various serums, vaccines, hormones, vitamins, antibiotics, antihistamines, and a host of others. The life expectancy of a child has increased from fifty years in 1900 to sixty-eight years at the present time. With these results already recorded, Franklin's predictions, which relate to 830 years hence, will in large measure be correct.

Pictures of the past show log cabins, sailing frigates, oil lamps, caravans, and prairie schooners, crude utensils, hand weaving, and the man with the hoe cultivating the fields. Today life is mechanized, electrified, abundant, easy, because of the push-button era. In the future citizens will more effectively farm the land and the seas; obtain necessary minerals from the oceans; clothe themselves from coal and oil; keep themselves warm by using the stored energy of the sun; be cured of any ailments by a variety of drugs and medicinals; be happy, healthy and kittenish at one hundred years of age; and perhaps attend interplanetary football matches in the Rose Bowl.

Edward U. Condon, President-Elect of the AAAS

AT THE LAST MEETING of the American Association for the Advancement of Science, Edward U. Condon was chosen president-elect of the Association. The choice promises to be a happy and interesting one: the AAAS embraces all the sciences, discerning the linkages among them and the intellectual and social threads common to them all. Somewhat analogous qualities are characteristic of Condon: a breadth of scientific interests, appreciation of the essential unity of the sciences, and a sensitivity to the many problems confronting men of good will. And these qualities rest on the firm foundation of a genuinely creative intellect, revealed in his distinguished original research in theoretical physics, fully tempered in a variety of scientific and administrative positions—academic, industrial, and governmental.

Dr. Condon's birthplace was Alamogordo, New Mexico, which became famous when the first atomic bomb was exploded in the desert near by. He was born on March 2, 1902, and entered the University of California at Berkeley 18 years later. He received the B.A. degree with highest honors in 1924 and the Ph.D. in 1926. Awarded an International Education Board Fellowship, he studied in Göttingen and Munich in 1926–27.

The next ten years were devoted to teaching and research. On his return from Europe in 1927, he lectured in physics at Columbia University; he was appointed assistant professor of physics at Princeton the following year. In 1929 he accepted a professorship, at the age of 27, at the University of Minnesota, but returned to Princeton in 1930, teaching undergraduate and graduate physics and applying, in his own research, the new methods of quantum mechanics to problems of atomic and molecular structure and the interpretation of radioactivity.

In 1937 he was appointed associate director of research of the Westinghouse Electric Corporation. His assignment there was to improve and strengthen the program in fundamental physics, and he established the Westinghouse postdoctoral research fellowship plan. As part of this program, he directed a group of young physicists in the construction and research application of a large, high-voltage electrostatic generator, and research was carried on several years before the discovery of fission and general recognition of the importance of applied nuclear physics. During this period Condon also served as advisory professor to the University of Pittsburgh and was particularly active on the committee that stimulated the raising of funds for the construction of a cyclotron by the university's medical school prior to the war.

Condon launched into war work at Westinghouse in the fall of 1940, soon after the establishment of the National Defense Research Committee. He was one of the original founding group of the Radiation Laboratory at MIT, where he organized the theoretical group and started the work on theory of directional antennas and of the microwave magnetron and reflex klystron. He was appointed chairman of the Microwave Committee of Westinghouse, organized to manage and develop research and production programs in this field at the company's Pittsburgh, Baltimore, and Bloomfield establishments.

In 1941 he became a member of the NDRC Rocket Committee and of Sub-Committee S-1. The latter had responsibility for the establishment of the government's uranium project and made the decisions leading to the creation of the Manhattan District. In the spring of 1943 Condon undertook to assist Robert Oppenheimer in the organization of the Los Alamos Laboratory. In the fall, at the urgent request of E. O. Lawrence, he undertook theoretical work on the electromagnetic isotope separation project at the University of California. He returned to Westinghouse in Pittsburgh in February 1945, resigning in October to accept appointment as director of the National Bureau of Standards.

In addition to the directorship of the bureau, Dr. Condon was appointed a member of the National Advisory Committee for Aeronautics, chairman of the Federal Specifications Board, member of the Interdepartmental Committee on Scientific Research and Development, chairman of the Senate Advisory Committee on Color Television, and scientific advisor to the Senate Special Committee on Atomic Energy. His activities at the bureau were concerned with both scientific and administrative problems. During his tenure the bureau increased considerably its research programs for defense, developed new fields (applied mathematics and electronic computers, for example), and acquired important new facilities at Corona, California, and Boulder, Colorado. Dr. Condon resigned on September 30, 1951, to assume his present position as director of research and development for the Corning Glass Works.

Throughout these years, he maintained an active interest in the various scientific societies and groups. He was president, American Physical Society (1946); member, Governing Board, American Institute of Physics (1945–48); member of the National Research Council; chairman, Committee on Chemical Constants and Committee on Fundamental Physical Constants (NRC); member, Visiting Committee of Department of Physics of the Board of Overseers, Harvard University; member, Advisory Council of the Department of Electrical Engineering, Princeton University; member, Board of Visitors to the Physics Department, Union College. He was elected a member of the National Academy of Sciences in 1944, the American Academy of Arts and Sciences in 1947, the American Philosophical Society (Philadelphia) in 1949, and

served as president of the Philosophical Society of Washington during 1951. In 1950 both the University of Delhi, India, and the New Mexico School of Mines awarded him the honorary D.Sc. In 1951 he was elected an honorary member of the Société Française de Physique—an honor previously accorded to only nine other scientists. He was also elected a fellow of the Royal Society of Arts (1949) and a member of the Royal Swedish Academy of Engineering Sciences (1950).

This list of biographical facts is incomplete, and it does not indicate the scope of his own research contributions to science. A few examples may suggest the scope of the latter. In the fall of 1928 he developed, with R. W. Gurney, the quantum mechanical theory of α-particle radioactivity, which is one of the important basic principles of all modern theories of nuclear structure. In this same period occurred that application of quantum mechanics to principles governing nuclear transitions in band spectra, which has come to be known as the Franck-Condon principle. While at Princeton, he published a number of special research papers on atomic and molecular structure. Two may be mentioned as of some interest a little outside the field: a review of previous theories of optical rotatory power of materials like sugar containing an asymmetrically bound carbon atom and, second, the development of a new form of quantum mechanical theory of this property. During the Minnesota period, he applied the Franck-Condon principle to predictions concerning processes by which molecules dissociate under electron impact in such a way that fragments acquire large amounts of kinetic energy. In 1928–29 he wrote, jointly with P. M. Morse, the first American book on *Quantum Mechanics*. Between 1932 and 1935 he wrote *The Theory of Atomic Spectra*, with G. H. Shortley as joint author, the first complete treatment of the subject in terms of modern quantum mechanics.

To these sober achievements, one should add the many lighter ones. The "Nimatron" is as good an example as any. The game of Nim was frequently played by Westinghouse scientists at lunch. Condon one day made an idle remark to the effect that he could design a machine that would play the game—and win. Westinghouse took him up on this, deciding that the device would be an attraction at its exhibit in the New York World's Fair. Condon thereupon created, in effect, the first electronic digital computer. It worked only too well: players at the Fair were exasperated by the diabolical rapidity and sureness of the machine, and noisy delays were added to the monster so that human players—still usually defeated—could have the satisfaction of making the Nimatron grunt and heave appropriately.

The light touch is shown best, as many know, in Condon's conversation and addresses, the grace and humor of which are relevant attributes of his mind. The following paragraph from his paper on "Foundations of Nuclear Physics" is a minor example of this quality:

> Whenever one writes an outline of the history of atomic physics, he must start with an appropriate allusion to Lucretius, the Latin poet in whose *De Rerum Natura* we find the idea poetically stated about two thousand years ago that all matter is made of atoms. This does not so much prove that the writer has read Lucretius as that he has read other historical articles on atomic theory.

No matter how complete the list of titles, positions, and accomplishments, there is still the interesting question of the essential nature of the man. Perhaps the single word that best describes Condon is humanness, a quality that in him is neither acquired nor calculated but is innate. The obvious manifestations of his humanness are his integrity, candor, warmth, humility, and humor, combined with a great love of life and incessant curiosity about its diverse aspects. These qualities account in some measure for his productivity in various areas of the sciences, for his interest in such subjects as religion, philosophy, and the social sciences, and, perhaps, for a flair for conversation and wit and a facility in writing that are unusual.

These qualities also account in some measure for his devotion of much time, energy, and genuine interest to others. At Princeton he devoted considerable attention over a period of five years to the development of a special honors course for freshmen in general physics, which carried the students much farther than is usually done in freshman courses. He has helped to develop many young physicists—for example, in the Westinghouse Research Fellowship program, which he directed. In the first group of appointees were J. A. Hipple, now in charge of mass spectrograph developments at the National Bureau of Standards; W. E. Shoupp, now in charge of the Westinghouse atomic energy program; W. E. Stephens, professor of physics at the University of Pennsylvania; Signey Siegel, now assistant technical director of the atomic energy program of North American Aviation; and R. O. Haxby, professor of physics at Purdue University. At Princeton he supervised the work of Edwin McMillan, Frederick Seitz, and G. H. Shortley—each of whom today holds a high place in American physics.

The selection of Dr. Condon as president-elect is, of course, an honor: his career, sketched here hurriedly and incompletely, would suggest that the honor is an appropriate one. The selection is also, however, appropriate in another sense. The AAAS stands as the major integrating organization of science in America, and science today is confronted with many new problems and many new permutations of old ones. Some of these problems have been quite evident in the years since the war; many of them have developed from the growing interrelationships of science in the university, in industry, and in government. For reasons like these, Condon's selection is perhaps especially appropriate at this time, for he brings to the Association considerable experience in all these arenas, firmly based on personal scientific achievement and on proved ability to lead and direct, fortified by those spiritual qualities without which knowledge and talent alone are often of little avail in human affairs.

News and Notes

Curare and Anticurare Agents: A Symposium

A CONFERENCE on curare and anticurare agents, held June 21–22, 1951, under the sponsorship of the New York Academy of Sciences, was organized by John A. Aeschlimann. Klaus Unna served as chairman, and E. D. Goldsmith, chairman of the Section of Biology of the academy, opened the meeting with a review of the history of the curare compounds, contrasting the early use of curare as an arrow poison with its clinical use today. Elmer L. Sevringhaus indicated that the mode of action of curare agents and their antagonists requires further elucidation, and the need for a suitable antidote was emphasized.

Recent advances in the pharmacology of curare were reported by A. R. McIntyre, A. L. Bennett, and C. Hamilton. *d*-Tubocurarine has an immediate excitatory action followed by depression. It also paralyzes autonomic ganglia, whereas decamethonium does not. New synthetic curariform agents may be divided into three classes: blocking agents like *d*-tubocurarine, depolarizing agents like decamethonium, and intermediary types like succinylcholine. Neostigmine is an effective anticurare agent in the early phases of paralyses by *d*-tubocurarine, but it is ineffective in excess curarization. Tetraethylammonium is still effective in the latter state. According to David F. Marsh, 16 alkaloids from calabash curare have been examined pharmacologically. Toxiferine I, which has only one quaternary nitrogen, has a much higher potency than *d*-tubocurarine in mice and dogs. C-curarine I and toxiferine I have a blocking action essentially free of side effects. James D. Dutcher reported on the isolation and identification of alkaloids in *Chondodendron tomentosum*. Besides *d*-tubocurarine, the extracts contained *d*-chondrocurarine and *l*-tomentocurarine.

A paper on the curarization of denervated muscle was presented by L. W. Jarcho, B. Berman, C. Eyzaguirre, and J. L. Lilienthal, Jr. *d*-Tubocurarine, decamethonium, and acetylcholine can stimulate and depress various functions of skeletal muscle, and the predominant effect depends on the test object and experimental conditions. There may thus be more than the two classes, the curarelike agents and the acetylcholinelike agents. W. D. M. Paton discussed the pharmacology of decamethonium, which Paton and Zaimis, and Barlow and Ing had earlier shown to be a powerful neuromuscular blocking agent. In the present paper, the differences between decamethonium and *d*-tubocurarine blocking action were discussed. Decamethonium blocks by depolarizing the end plate, whereas *d*-tubocurarine blocks by raising the threshold of the end plate to acetylcholine; decamethonium has a stimulant action on skeletal muscle, whereas *d*-tubocurarine does not stimulate. A muscle paralyzed by decamethonium is inexcitable by direct electrical stimulation, but the muscle paralyzed by *d*-tubocurarine remains excitable. The neuromuscular block produced by decamethonium is stable and not reversed by such antidotes to *d*-tubocurarine as neostigmine and *m*-hydroxyphenylalkyl ammonium compounds. The latter substances add to the depolarizing action of decamethonium, but they counteract the threshold-raising action of *d*-tubocurarine. Large differences in sensitivity to the two types of blocking agents are exhibited by various species of animals, as well as by various muscles within an animal.

Edwin J. de Beer and co-workers reported on synthetic drugs influencing neuromuscular activity. Ester groups substituted in the carbon chain of decamethonium decreased the potency and duration of the blocking action. Amide linkages reduced potency still further, but these compounds potentiated the action of the esters. The 4-stilbazoline derivatives were strong blocking compounds, and this action was antagonized by the 2-stilbazoline derivatives, which are also antagonists of decamethonium. James O. Hoppe described a new series of synthetic curarelike compounds. The most active compound in rabbits and dogs was Mytolon chloride—2,5-bis(3-diethylaminopropylamino)-benzoquinone-bis-benzyl chloride. Mytolon resembles *d*-tubocurarine in its effect on the frog rectus, antagonism to decamethonium, potentiation by ether, and, to a certain extent, antagonism by neostigmine. It resembles decamethonium in its acute toxicity in the rat. The compound has anticholinesterase activity about one fourth that of neostigmine. It stimulates parasympathetic ganglia but has no effect in sympathetic ganglia and no vasodepressor effects.

Daniel Bovet, who is considered the father of synthetic curarelike agents, submitted a manuscript on the relationships between chemical constitution and curarelike activity. Dr. Bovet did the original work on Flaxedil and succinylcholine, establishing the fact that many synthetic compounds having two or more quaternary nitrogens have high potency. He proposed the term "pachycurare" for those agents which resemble *d*-tubocurarine and Flaxedil, and "leptocurare" for those related to decamethonium and succinylcholine. The pachycurares block acetylcholine in mammals, whereas leptocurares have a depolarizing action and a reciprocal antagonism in muscle. Pachycurares produce paralysis in birds, whereas the leptocurares produce contracture and convulsions. On frog muscle, pachycurares antagonize acetylcholine, but the leptocurares produce a contraction like that of nicotine or acetylcholine. Flaxedil, the pharmacology of which was presented by Walter F. Riker, Jr., and W. Clarke Wescoe, blocks the neuromuscular junction in a manner similar to that of *d*-tubocurarine and it is about one third as potent. The blocking action is antagonized by 3-hydroxyphenyltrimethylammonium bromide, and replacement of the ethyl radicals with methyl radicals reduces the neuromuscular, as well as the vagal, blocking action.

The comparative pharmacological properties of anticurare agents such as acetylcholine, neostigmine, 3-hydroxyphenyltrimethylammonium bromide (Ro 2-2561), 3-acetoxyphenyl trimethylammonium bromide (Ro 2-2017), and phenyltrimethylammonium bromide were described by Wescoe and Riker. All these compounds have both stimulating and depressing actions at the neuromuscular junction, but the relative potency in each respect varies greatly with the test object and the experimental conditions. The anticurare activities of neostigmine, Ro 2-2561, and Ro 2-2017 are equal in cats, but neostigmine has much greater cholinergic activity. These compounds act by displacing curare from its site of action by direct competition.

Lowell O. Randall reported on synthetic curarelike agents and their antagonists. Tensilon chloride (3-hydroxyphenyldimethylethylammonium chloride) is a specific anticurare agent that lacks the cholinergic effects of neostigmine. It is antagonistic to *d*-tubocurarine, dimethyl *d*-tubocurarine, Flaxedil, and dihydro-β-erythroidine, but not to decamethonium or Mytolon. In a new series of bipiperidine derivatives, the substitution of aromatic groups on the nitrogen atoms converted Tensilon-irreversible agents of the decamethonium class to Tensilon-reversible agents of the tubocurarine class.

Harold R. Griffith, who was the first to use curare in anesthesiology, has since studied mephenesin, decamethonium, *d*-tubocurarine, dimethyl *d*-tubocurarine, Flaxedil, and Win 2747 (Mytolon chloride) and has found them to be reasonably safe and effective as anesthetics, although all these drugs occasionally produce unusual reactions. The evaluation of curarizing drugs in man was discussed by Klaus R. Unna and E. W. Pelikan, who reported good agreement between the potency of various agents as measured in unanesthetized man, and as recognized by anesthesiologists. Decamethonium is about five times as potent as *d*-tubocurarine; dimethyl-*d*-tubocurarine two and one-half times, and Flaxedil one fifth, as potent as *d*-tubocurarine. The three drugs are also shorter in duration than *d*-tubocurarine. Dimethyl-*d*-tubocurarine and Flaxedil depress respiratory muscles less than *d*-tubocurarine, but decamethonium depresses them as much, or more.

A. O. Console discussed the clinical use of *d*-tubocurarine in surgery; in manipulative procedures such as intubation; in convulsive and electroshock procedures to soften the convulsions; and in spasticity and other neuromuscular dysfunctions. In conditions of muscle spasm, it is desired to filter out abnormal impulses without loss of voluntary power. The use of Mytolon chloride in anesthesiology was presented by Frances F. Foldes, who believes it is the agent of choice for production of muscular relaxation in major abdominal operations. The anesthetic course was found smoother, and the incidence of operative complications was less than with any other muscle relaxants studied. J. F. Artusio and co-workers reported on a quantitative study of *d*-tubocurarine, Flaxedil, and a series of trimethyl- and dimethylethylammonium compounds in anesthetized man. The dose-response of *d*-tubocurarine is not predictable on a mg/kg basis, whereas that of Flaxedil is. Ether potentiated the action of *d*-tubocurarine, but not of Flaxedil. Both drugs showed cumulative action. Flaxedil had vagolytic action at all doses. The anticurare agents Ro 2-2017, Ro 2-2561, and Ro 2-3198 (Tensilon) were effective antagonists to tubocurarine and Flaxedil. Multiple doses were effective, and there was no accumulation. The only side action was a transient cardiac slowing, which was abolished by atropine.

Klaus Unna served as chairman of the four sessions of the conference, which was well attended.

L. O. Randall

Hoffmann-La Roche, Inc.

E. D. Goldsmith

New York University
College of Dentistry and
Office of Naval Research, New York

Scientists in the News

Paul B. Beeson, of Atlanta, has been appointed Ensign professor of medicine and successor to **Francis G. Blake** as chairman of the Department of Internal Medicine at Yale. Dr. Blake died Feb. 1, while on leave as civilian director of Army Medical Research. Dr. Beeson has been chairman of the Department of Medicine of the Emory University School of Medicine since 1946. In his new position he will also be physician-in-chief of the University Service in the Grace-New Haven Community Hospital.

C. H. Best, of the University of Toronto, has been named president and will preside at the XIX International Physiological Congress, which will meet in Montreal Aug. 31–Sept. 4, 1953.

Frederic Bonnet, pioneer in the development and utilization of rayon, will receive the Harold De Witt Smith Memorial Medal, awarded for outstanding accomplishment in the field of textile fiber science and utilization. The medal was endowed in 1949 by the Fabric Research Laboratories, Boston, Mass., and is given at intervals of not less than one year by Committee D-13 on Textile Materials of the American Society for Testing Materials. Dr. Bonnet has been director of the Standards Department, American Viscose Corp., and since 1946, when he retired, consultant and technical adviser to the president.

Konrad J. K. Buettner, research fellow in bioclimatology at the Air Force School of Aviation Medicine, has accepted a position in the Department of Engineering of the University of California at Los Angeles. A native of Hannover, Germany, Dr. Buettner studied physics and geophysics at the universities of Erlangen, Hannover, and Goettingen. During the war, Dr. Buettner served as a section chief in the Aeromedical Institute at Rechlin, near Berlin. In 1947, with several other German aeromedical special-

ists, he signed a five-year USAF contract and was assigned to the School of Aviation Medicine. There he has specialized on radiation and related subjects.

Winners of the Highway Research Board Award for the best paper on highway research published by the board last year are **Thomas J. Carmichael,** administrative engineer, General Motors Proving Ground, and **Charles E. Haley,** project engineer of the Committee on Vehicle Characteristics, Phoenix, Ariz. Their paper was a study of the statistical measurement of relationships among vehicle, roadway, and traffic conditions. The award was instituted in 1940 by the Highway Research Board of the National Research Council. **Roy W. Crum,** late director of the Highway Research Board, was posthumously given the George S. Bartlett Award and the Highway Research Board Distinguished Service Award for his outstanding contribution to highway progress. The awards were accepted in memory of Mr. Crum by **Fred Burggraf,** who succeeded him as director of the board. The Distinguished Service Award was established by the Highway Research Board in 1948 for recognition of outstanding achievement in highway research.

Four national awards for outstanding contributions in the field of industrial heating were presented at the mid-winter meeting of the Industrial Furnace Manufacturers Association. The awards were made to **Guilliam H. Clamer,** president of the Ajax Group Companies, Philadelphia; **William A. Darrah,** president of Continental Industrial Engineers, Inc., Chicago; **Adolph W. Machlet,** chairman of the board, American Gas Furnace Co., Elizabeth, N. J.; and **Frederick H. Norton,** professor of ceramics, Massachusetts Institute of Technology.

William B. Cosgrove, assistant professor of zoology at the State University of Iowa, has been appointed to the staff of the Itasca Park Biological Station of the University of Minnesota for the coming summer, to conduct the course and research work in protozoology.

Leon J. De Merre, a biologist formerly with the Army of Occupation in Japan, has been transferred to the Chemical Corps, and is now chief, Planning Branch, Planning and Evaluation Office, Dugway Proving Ground, Tooele, Utah.

E. E. Donath has been appointed head of a new coordinated fuels processing section of the research department at the Koppers Company's Pittsburgh plant. The section is designed to accelerate research not only in coal carbonization, but to probe more deeply the gasification and hydrogenation of coal, with particular emphasis on chemicals that may be produced.

The newly formed Minerals and Metals Advisory Board, which will serve in an advisory capacity on metallurgical problems to the Department of Defense and other government agencies, will have **Francis C. Frary,** retired director of research at the Aluminum Co. of America, as its chairman. The new board is a reconstitution of the Metallurgical Advisory Board formed in January 1951. **Zay Jeffries,** retired vice president of General Electric Company, and **Robert F. Mehl,** director of the Metals Research Laboratory, Carnegie Institute of Technology, will serve as vice chairmen.

Owen S. Gibbs, director of the Gibbs Medical Research Laboratory, Memphis, Whitehaven, Tenn., has been appointed visiting professor of physiology and pharmacology at the University of Arkansas School of Medicine from January to July 1952.

Eta Kappa Nu, national honorary electrical engineering society, has named **Lewis C. Gitzendanner** the outstanding young electrical engineer of 1951. He is employed in the General Electric Company's general engineering laboratory at Schenectady, N. Y. **Burton R. Lester,** of the GE electronics division laboratory, Syracuse, and **Robert L. Trent,** of Bell Telephone Laboratories, Murray Hill, N. J., received honorable mention.

Martin Goland, associate director for engineering at Midwest Research Institute of Kansas City, has been appointed a member of the Committee on Aircraft Construction, a technical affiliate of the National Advisory Committee for Aeronautics. He will also serve as chairman of the Subcommittee on Vibration and Flutter. Mr. Goland is editor of *Applied Mechanics Reviews,* a magazine published at Midwest Research Institute under the auspices of the American Society of Mechanical Engineers.

Aubrey Gorbman has been named chairman of the Department of Zoology at Columbia University. Dr. Gorbman has been on the staff of the Child Cancer Foundation at Yale. At present a Fulbright fellow, Dr. Gorbman is on leave of absence studying at the Collège de France in Paris.

Roy O. Greep, professor of dental science, has been appointed dean of the School of Dental Medicine, Harvard University. **Reidar F. Sognnaes,** associate professor of dental medicine, will be associate dean. The new dean succeeds **James M. Dunning,** who has completed a five-year term and wishes to return to the practice of dentistry. He will continue teaching as a lecturer in public health dentistry.

Leroy R. Grumman has received the 1951 Honorary American Fellowship of the Institute of the Aeronautical Sciences. The 1951 Foreign Honorary Fellowship was presented to **John Hamilton Parkin,** director of the National Aeronautical Establishment, Canada. Mr. Grumman is chairman of the board of the Grumman Aircraft Engineering Corporation.

David J. Guy has been elected executive vice president of the American Watershed Council, Inc., national association of local, state, and regional watershed organizations. Mr. Guy was manager of the natural resources department of the Chamber of Commerce of the United States until his retirement last Nov. 30.

Among recent visitors at the National Bureau of Standards were **A. R. Hamoui,** professor of physics and electrical engineering, University of Damascus; and **H. Yamashita,** Electrical Engineering Department, Faculty of Engineering, Tokyo University, Japan.

Ernest H. Huntress, who joined the staff of the Department of Chemistry at MIT in 1920, has been appointed director of the Institute's Summer Session. He will succeed **Frederick G. Fassett,** who was recently appointed associate dean of students. Since 1950 Dr. Huntress has devoted a portion of his time to the Office of the Dean of the Graduate School, serving as deputy dean. If his duties as director of the Summer Session permit, he will continue to assist the dean of the Graduate School.

The second award of the William Procter Prize for Scientific Achievement was presented to **Ernest O. Lawrence,** of the University of California, Berkeley, by the Scientific Research Society of America at the AAAS meeting in Philadelphia on Dec. 27.

Robert K. S. Lim has joined the Miles-Ames Research Laboratory, Elkhart, Ind., the research division of Miles Laboratories, Inc., and Ames Company, Inc. He is head of the Section of Physiology and Pharmacology. Dr. Lim, professor of physiology at the Peiping Union Medical College in 1924, was surgeon general of the Chinese Nationalist Army from 1945 until 1949. Following the retreat to Formosa, Dr. Lim returned to the U. S., where he was visiting research professor of physiology at the University of Illinois a year and then professor and head of the Department of Physiology and Pharmacology at Creighton University Medical School in Omaha. He has just resigned this position to join the Miles-Ames staff.

Donald L. McKernan has been appointed assistant director, Pacific Oceanic Fishery Investigations at Honolulu, succeeding **John L. Kask,** who left Honolulu in December to become chief, Office of Foreign Activities for the Fish and Wildlife Service in Washington, D. C. Mr. McKernan leaves the post of director of research for the Fish Commission of Oregon, which he occupied for more than six years. His extensive experience in fishery research and administration also includes four years with the State of Washington Department of Fisheries, where he directed research on the shellfish resources of the state.

E. H. Mercer, Australian wool scientist, has joined the Textile Research Institute's staff for a year of cooperative study and research with the International Wool Research Project. The Wool Research Project, on which he will also work, is sponsored by The Wool Bureau, Inc., the American Wool Council, the National Wool Trade Association, ONR, USDA, and several American wool manufacturers. At the end of his year in this country, Dr. Mercer plans to return to the Division of Industrial Chemistry of the Commonwealth Scientific and Industrial Research Organization, of Melbourne, Australia.

W. Albert Noyes, Jr., chairman of the Department of Chemistry, University of Rochester, has assumed the editorship of the *Journal of Physical Chemistry.* Professor Noyes, a former president of the society, is also editor of the *Journal of the American Chemical Society.* In his new post he succeeds **Samuel C. Lind,** dean emeritus of the University of Minnesota Institute of Technology, who is now with the Carbide and Carbon Chemical Company at Oak Ridge, Tenn. **Allen D. Bliss,** of Simmons College, managing editor of the *Journal of the American Chemical Society,* and **Arthur C. Bond,** of the University of Rochester, have been appointed assistant editors of the *Journal of Physical Chemistry,* of which the society became publisher on Jan. 1. Previously, although owned and edited by the society, the magazine had been published by the Williams & Wilkins Company of Baltimore. Appointment of **N. Howell Furman,** chairman of the Department of Chemistry at Princeton, **David N. Hume,** associate professor of chemistry at MIT, and Stewart **S. Kurtz, Jr.,** manager of the Norwood (Pa.) Laboratory of the Sun Oil Company and an assistant editor of *Chemical Abstracts,* to the advisory board of *Analytical Chemistry* has also been announced.

Dennis Ostle, senior geologist of the British Geological Survey (Department of Scientific and Industrial Research), assisted by **F. H. Hale,** of the Atomic Energy Research Establishment of the British Ministry of Supply, and officers of the Sierra Leone and Gold Coast geological surveys, is directing an exploratory survey of Sierra Leone and the Gold Coast. Principal objects of the search are the radioactive minerals of uranium and thorium, and new detecting equipment will be used in the survey.

The Society of Automotive Engineers has awarded **Daniel L. Pastell,** of the Du Pont Company's Petroleum Laboratory staff, the 1950 Horning Memorial Award, which is given annually to the author of the best paper on the adaptation of fuels to internal combustion engines. Mr. Pastell's paper, "Precombustion Reactions in a Motored Engine," was presented at the SAE summer meeting. **Harry LeVan Horning,** in whose memory the award is given, was a leader in a movement to bring the automotive and petroleum industries together to deal with the fuel problem.

Eugene F. Poncelet has joined the Division of Geophysics and Geology of the Department of Applied Physics, Stanford Research Institute, and will continue his research on the nature of fracture and flow of solids. From 1945 until he joined the institute, he was connected with the Owens-Illinois Glass Company as a research professor at the University of Utah, where he spent two years conducting theoretical research on fracture and flow for that company.

S. Wyman Rolph, president, The Electric Storage Battery Company, has been elected president of The Franklin Institute. The retiring president, **Richard T. Nalle,** president of the Midvale Company, was appointed to the board of managers to fill Mr. Rolph's

unexpired term. **Morton Gibbons-Neff,** Philadelphia insurance broker, was elected a vice president of the institute, and **E. G. Budd, Jr.,** president of the Budd Company and a retiring institute vice president, was named to the board. **C. M. Waterbury** was elected assistant treasurer.

W. D. Wright, professor of technical optics in the Imperial College of Science and Technology, University of London, is currently making a three months' visit to the U. S., to confer with American workers in the fields of color vision and color measurement. As Adolph Lomb Memorial Lecturer for 1952 of the Optical Society of America, Dr. Wright will address the society at its New York meeting in March and will visit the several local sections. His headquarters are at Tufts College, where he is serving as visiting professor of optics for the spring semester.

Eugene M. Zuckert has been nominated by President Truman to be a member of the Atomic Energy Commission. An attorney by training, he has been assistant secretary of the Air Force since 1947.

Education

The **American College of Allergists** will sponsor a graduate instructional course in allergy at the Hotel William Penn, Pittsburgh, Apr. 4–6, immediately preceding its annual congress. The course will include a symposium on industrial allergy, and round-table discussions on psychodynamics and on the diagnosis and treatment of asthma. Further information may be obtained from Fred W. Wittich, 401 La Salle Medical Bldg., Minneapolis.

The joint American-Canadian expedition **"Eager Beaver"** will spend six months building emergency airstrips on muskeg and frozen lake surfaces in the Canadian Yukon. Three hundred U. S. and 135 Canadian engineers will take part in the project, during which the capabilities and limitations of equipment and personnel will be tested in temperatures that may fall as low as –65°.

In a series of seminars at **Harvard University** during February and March on "Chemical Specificity in Biological Interactions" U. S. scientists will assess the state of knowledge and the outlook in this field. Among the speakers will be E. J. Cohn, W. E. Cohn, Carl F. Cori, C. D. Coryell, T. F. Gallagher, R. B. Turner, V. du Vigneaud, and Shields Warren. The meetings are open to the public and are being held Thursday evenings (except the last, which is on Friday) through Mar. 28.

The Tissue Culture Program of the **Mount Desert Island Biological Laboratory,** Salisbury Cove, Maine, will be open June 15–Sept. 15 to qualified applicants whose research problems, either in animal or plant biology, may be approached by tissue culture methods. Applications should be submitted before *Mar. 15* to Philip R. White, Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine.

The Harry Carothers Wiess Chair of Geology has been established at the **Rice Institute** through a gift of $1,570,000 from Mrs. Wiess in memory of her husband, former vice chairman of the Board of Trustees. It is hoped that selection of some of the faculty—a full professor of geology and two associates—may be made in time to begin classes in the newly established division in September. Main emphasis will be on marine geology.

The Friend E. Clark Lectureship at **West Virginia University** will be held this year by Ludwig F. Audrieth, of the University of Illinois. He will speak Mar. 10 on "The Chemistry of Hydrazine," and Mar. 11 on "Poly- and Meta-Phosphates." West Virginia U is celebrating its eighty-fifth anniversary this year.

Grants and Fellowships

With funds furnished by the **Carnegie Foundation of New York** the Roscoe B. Jackson Memorial Laboratory is offering two summer fellowships for interdisciplinary research between the biological and social sciences. Applicants should have the Ph.D or its equivalent in psychology, anthropology, or sociology to study problems having biological aspects, or persons with similar training in biology or animal behavior to study problems with psychological or sociological aspects. Fellowships carry a stipend of $600 for an eight-week minimum stay, plus allowance for research expenses. Inquiries and applications should be sent prior to *Mar. 1* to J. P. Scott, Division of Behavior Studies, Box 847, Bar Harbor, Maine.

The **Conservation Foundation** has received an anonymous grant of $22,500 for a comprehensive survey of existing activities in various countries in regard to the relationship of natural resources and population pressures. The work of such agencies as WHO, FAO, ILO, and Unesco, as well as that of individual governments and private agencies, will be appraised to discover what each agency considers the problem to be, what it is doing in its particular area, and what the results have been. It is expected that at the conclusion of the analysis in 1953 the foundation will be able to show what will be the most valuable approaches to particular problems.

The **Grass Trust for Research in Neurophysiology** offers a fellowship for work at the Marine Biological Laboratory, Woods Hole, for the summer of 1952. The fellowship carries a stipend of $1,000 and is in general designed for young investigators in the pre- or early postdoctoral stage. Applications, *in triplicate,* endorsed or submitted by a senior investigator, giving full information as to background and research plans of the candidate, should be sent to Robert S. Morison, Rm. 5500, 49 W. 49th St., New York 20, before *Mar. 15.* Selection will be made by Apr. 15.

Applications for the 1952 **Guggenheim Jet Propulsion Fellowships** for graduate study at Princeton and Caltech will be accepted until *Mar. 1* by the Guggenheim Foundation, 120 Broadway, New York 5. From

18 to 24 grants will be awarded, and each will provide tuition and an allowance for living expenses ranging from $1000 to $2000.

Illinois Institute of Technology will accept applications for graduate assistantships, scholarships, and fellowships for the fall semester until *Mar. 15*. Graduate courses are offered in 28 fields, half-time and third-time teaching assistantships are available in all departments, and there are fellowships providing stipends up to $1500 a year plus tuition in some departments. A few full-tuition scholarships will be offered to exceptional students. Ceco Steel Products Corporation, of Chicago, has established two new engineering scholarships at Illinois Tech and will employ the winners at its plant for eight or more weeks during the summer. A grant of $40,000 recently received from the Delta-Star Electric Company will provide for one or more undergraduate scholarships, and the food processing fellowship in food engineering established last year by the Putman Publishing Company (SCIENCE, **114**, 453 [1951]) will be continued.

The **National Institute of Arthritis and Metabolic Diseases**, new USPHS institute, has announced a program of clinical traineeships in prevention, diagnosis, and treatment, to improve the competence of physicians in the treatment and rehabilitation of arthritis patients. Annual stipend for trainees without dependents is $3,000; with dependents, $3,600. For additional information and application forms, write to Chief, Extramural Programs, National Institute of Arthritis and Metabolic Diseases, Bethesda 14, Md.

Meetings and Elections

Don P. Johnston, of Wake Forest, N. C., has been elected president of **The American Forestry Association**, succeeding D. C. Everest. John M. Christie, of Washington, D. C., was re-elected treasurer. Seven new directors were elected and 21 honorary vice presidents.

At its annual meeting in Montreal the **American Ornithologists' Union** re-elected Josselyn Van Tyne president, Alden H. Miller and Ludlow Griscom vice presidents, Harvey I. Fisher editor of *The Auk*, and Reuben Moser treasurer. Albert Wolfson was elected secretary.

At the 1951 annual meeting of the **Central Neuropsychiatric Association** in St. Paul and Minneapolis last October, the following officers were elected: president, Raymond W. Waggoner; vice president, Lee M. Eaton; secretary-treasurer, Hamilton Ford; counselor, Frank Luton. The 1952 meeting will be held in Nashville during October.

The **Colloquium of College Physicists** meeting at the University of Iowa June 11–14, will be joined by the **American Association of Physics Teachers** for its summer meeting. Special features will be four lectures by George E. Uhlenbeck, of the University of Michigan, and the annual exhibit of new devices, both experimental and nonexperimental, for which prizes are offered.

The **Essential Oils Association of the U. S. A.** has elected George H. McGlynn president, succeeding Gerard Danco, and Waldo Reiss vice president. Pierre J. Coutin was re-elected secretary-treasurer.

The **Institute of Medicine of Chicago** has elected Vincent J. O'Conor, of Northwestern, president for 1952. Henry T. Ricketts, of the University of Chicago, was elected chairman of the board, and George H. Coleman, secretary.

At its meeting at Brown University last December the **Mathematical Association of America** elected the following officers: first vice president, F. L. Griffin (2 years); secretary-treasurer, H. M. Gehman (5 years); members of the Board of Governors, D. H. Lehmer, W. E. Milne, and F. H. Steen. Continuing in office are Saunders MacLane, president, and Jewell H. Bushey, second vice president. The summer meeting of the association will be held Sept. 1 at Michigan State College.

At its annual meeting in Los Angeles in October, the **National Rehabilitation Association** named Corbett Reedy president-elect, and J. O. Talley became president. Ashley Ross was re-elected treasurer, an office he has held since 1946, and Holland Hudson and Edward Stiles were elected members at large of the board of directors.

The second interuniversity **Summer Seminar in Statistics**, held at the University of Connecticut, Storrs, Aug. 6–30, devoted a week each to biometrics, time series, statistical theory and probability, and techniques of interest in the social sciences. C. I. Bliss, J. Ipsen, M. G. Kendall, J. W. Tukey, M. Kac, H. Robbins, F. Mosteller, F. L. Strodtbeck, and M. A. Woodbury organized the various programs, which were attended by professional statisticians, students, and consumers interested in statistical techniques. Information concerning the 1952 sessions is available from D. F. Votaw, Jr., Leet Oliver Memorial Hall, Yale.

The annual **Symposium on Molecular Structure and Spectroscopy** will be held at the Department of Physics and Astronomy, Ohio State University, June 9–13. There will be discussions of the interpretation of molecular spectroscopic data and of methods for obtaining such data, as well as sessions devoted to phases of spectroscopy of current interest. For further information write to Harald H. Nielsen, Ohio State, Columbus 10.

A conference on **The Use of Isotopes in Plant and Animal Research**, to be held June 12–14 at Kansas State College, will be sponsored by the college, Argonne National Laboratory, and the Isotopes Division of the Atomic Energy Commission. A detailed program (and other information) will be available in March from R. I. Throckmorton, Kansas Agricultural Experiment Station, Manhattan.

Association Business

Howard A. Meyerhoff, *Administrative Secretary*

Administrative Officers

THE General Officers of the Association for 1952 were announced in the January 4 issue of SCIENCE (p. 3, advertising section); but in the attempt to have Council elections at Philadelphia duly recorded, the customary editorial control could not be exercised. In the list of Executive Committee members *Paul B. Sears* should have been assigned to Yale University; *Mark H. Ingraham,* to the University of Wisconsin; and *Laurence H. Snyder,* to the University of Oklahoma.

The few changes among the Administrative Officers, who were last listed in the July 6, 1951, issue of SCIENCE (p. 3), are incorporated in the ensuing current directory:

In Washington at 1515 Massachusetts Ave., N.W.:

Administrative Secretary, Howard A. Meyerhoff
Assistant Administrative Secretary, Raymond L. Taylor
Business Manager, Hans Nussbaum
Executive Editor, Gladys M. Keener

Section Secretaries:

Section A (Mathematics): Raymond W. Brink, University of Minnesota, Minneapolis.
Section B (Physics): Fred L. Mohler, National Bureau of Standards, Washington, D. C.
Section C (Chemistry): Edward F. Degering, 1860 Colonial Drive, Memphis, Tenn.
Section D (Astronomy): Frank K. Edmondson, Indiana University, Bloomington.
Section E (Geology and Geography): Leland Horberg, University of Chicago, Chicago.
Section F (Zoological Sciences): J. H. Bodine, University of Iowa, Iowa City.
Section G (Botanical Sciences): Stanley A. Cain, University of Michigan, Ann Arbor.
Section H (Anthropology): Marian W. Smith, Columbia University, New York.
Section I (Psychology): Delos D. Wickens, Ohio State University, Columbus.
Section K (Social and Economic Sciences): Conrad Taeuber, Bureau of the Census, Washington, D. C.
Section L (History and Philosophy of Science): Raymond J. Seeger, Bureau of Ordnance, Navy Department, Washington, D. C.
Section M (Engineering): Frank D. Carvin, Illinois Institute of Technology, Chicago.
Section N (Medical Sciences):
Subsection Nm (Medicine): Gordon K. Moe, University of Syracuse, New York.
Subsection Nd (Dentistry): Russell W. Bunting, University of Michigan, Ann Arbor.
Subsection Np (Pharmacy): Glenn L. Jenkins, Purdue University, Lafayette, Ind.
Section O (Agriculture): C. E. Millar, Michigan State College, East Lansing.
Section P (Industrial Science): N. V. Hendricks, Esso Laboratories, Linden, N. J.
Section Q (Education): Dean A. Worcester, University of Nebraska, Lincoln.

Officers of the Pacific Division:

President: H. A. Spoehr, Carnegie Institution of Washington, Stanford University.
Secretary: Robert C. Miller, California Academy of Science, Golden Gate Park, San Francisco.

Officers of the Southwestern Division:

President: Fred W. Emerson, New Mexico Highlands University, Las Vegas.
Secretary: Frank E. E. Germann, University of Colorado, Boulder.

Officers of the Alaska Division:

President: Laurence Irving, Aretic Health Research Center, Anchorage.
Secretary: Mrs. Robert P. Simmet, Arctic Health Research Center, Anchorage.

Council

At the meetings of the Council held in Philadelphia on December 27 and 29, in addition to the election of officers, the following business was transacted:

1. Warren Weaver presented a report on the Arden House Conference, and the Administrative Secretary summarized the suggestions received from approximately 85 council members and 25 additional members of the Association, in response to the request for suggestions and comments. Following discussion of the many factors involved in the evolution of Association policy, it was voted that the Council go on record as accepting in principle the Arden House statement as a guide in the formulation of policy and in the operations of the AAAS in the immediate future.

It was also voted that the chairman of the Executive Committee be authorized to appoint an over-all committee and subcommittees to study and analyze the various activities of the Association and to make specific recommendations to the Executive Committee with reference to the future program of the AAAS. It is understood that such recommendations as may be made will, following analysis and study by the Executive Committee, be placed before the Council at its meeting in St. Louis in December 1952.

2. *a*) Roger Adams presented a brief report on the activities of the Executive Committee during 1951, reminding the members of the Council that copies of the minutes of each Executive Committee meeting are now being sent to them and assuring them that this policy will be continued.

b) The report of the Administrative Secretary stressed the major activities of the Association during 1951, and special mention was made of the inauguration of the Alaska Division and of the new section (P) on industrial science, of the membership situation, and of staff shortages in the Washington office.

c) Fernandus Payne reported for the Publications Committee, stressing the fact that this committee is al-

ready engaged on a study of AAAS publications, and especially of SCIENCE and THE SCIENTIFIC MONTHLY, in harmony with the proposals of the Arden House statement of policy.

d) Howard Meyerhoff reported for the Editorial Board, emphasizing the changing ratio of circulation in the Association's two journals, as well as the plans to introduce more material of general interest and a wider variety of technical material into SCIENCE.

e) In the absence of the chairman of the Committee on Affiliation and Association, the Administrative Secretary reported briefly on the activities and problems of that committee during 1951. In the course of the year the following organizations were recommended for affiliation:

American Political Science Association
The Nature Conservancy
American Geophysical Union
American Society for Quality Control
The Society for Investigative Dermatology
American College of Apothecaries
American Medical Writers' Association
American Academy of Forensic Sciences
American Society of Safety Engineers
The Society for Applied Anthropology
The Society for Industrial Microbiology

For association:

American Society of Medical Technologists
Mississippi Valley Medical Society

The Council voted approval of the actions taken by the committee and endorsed by the Executive Committee.

f) Roger Adams reported for the Building Committee, stating that the Executive Committee had just endorsed the policy of proceeding with plans to build a new structure on the Scott Circle site. It was voted that Dr. Adams' report be accepted and approved, and that the committee be authorized to proceed as outlined.

g) Kirtley Mather reported for the Committee on the Revision of the Constitution and Bylaws, stating that the final revision of both these documents would be placed in the hands of the Council for final vote at the St. Louis meeting in 1952. He further reported on revised or new constitutions for the Pacific Division, the Alaska Division, and the Academy Conference. It was unanimously voted to approve the revised constitution of the Pacific Division, the new constitution of the Alaska Division, and the new constitution of the Academy Conference.

h) Morris Meister reported for the Cooperative Committee, outlining activities during 1951 and sketching plans for 1952. He announced that the next meeting of the committee will be held on May 23 at the University of Wisconsin.

i) Kirtley Mather reported on the Committee on the International Federation of Associations for the Advancement of Science and specifically upon actions taken by the Executive Committee to foster closer relations between such associations in other countries and the American Association.

3. Paul Klopsteg introduced for the Council's consideration the following resolution:

> The Council of the American Association for the Advancement of Science is profoundly disturbed over the present world conditions which so severely impede the free interchange of knowledge even among friendly nations. Danger to the future of our nation is implicit in such restrictions.
>
> The Council recognizes the need for measures which will effectively safeguard our security, but expresses its troubled concern over the manner in which such measures, in particular the McCarran Act, are being administered, to prohibit American citizens from going abroad and citizens of other nations from coming here to interchange knowledge of science which does not affect security.
>
> The Council strongly urges that the administrative procedures under the McCarran Act be reviewed and modified so as to minimize injustices and to increase both our internal strength and our prestige abroad.
>
> The Council further urges revision and improvement of the relevant portions of the act, to retain the objectives of necessary security, but with adequate provisions to maintain free interchange of knowledge that has no security implications.

Following extended and vigorous discussion, and following the failure of amendments to pass, it was voted that the resolution be adopted, and that copies thereof be sent to all members of the Congress and to the departments of the government chiefly concerned with the administration and effects of the McCarran Act.

4. Arthur H. Compton extended to the Association a most cordial invitation to St. Louis in 1952, in behalf of Washington University, which will observe its 100th anniversary during the year.

5. The Administrative Secretary outlined plans for future meetings. Definitely scheduled are the meetings at St. Louis, Dec. 26–31, 1952; and at Boston in December 1953. Tentatively settled, but subject to final confirmation by the Executive Committee, are plans for a meeting in San Francisco in December 1954, and in Chicago in December 1955.

The Administrative Secretary asked for a statement of opinion to guide the Executive Committee as to the relative advantages of a meeting in New York City or in Atlantic City in December 1956. Although several members definitely favor Atlantic City, the show of hands indicated that the majority was in favor of New York.

6. It was unanimously voted to extend the thanks of the Council, and of the AAAS as a whole, to the Philadelphia committee which played so important a part in the success of the 1951 meeting, and to those Philadelphia organizations which likewise gave such valuable assistance in completing arrangements for the meeting.

Finances

Condensed statements of Association finances for the year 1950, prepared by the auditing firm of G. P. Graham & Company, are published herewith, in order that the entire membership may be fully informed regarding financial operations, obligations, and resources of the AAAS.

The first two statements summarize operating receipts and expenditures. Once again the annuity payments to the Cattell estate for SCIENCE were drawn from the excess of receipts over expenditures in the operating account. As indicated in the note, the remainder of the excess is available as a reserve against future annuity payments, which included a stipulated amount of $50,854.03, plus an inflation adjustment that would total $42,783.50, if computed at the 1950 rate. Partly as a means of covering this obligation and

partly to create an initial fund that may ultimately be applied to the construction of a new building, the Executive Committee, in 1951, set aside $250,000 from the Operating Fund as a reserve.

The last two statements summarize the status of investment funds. In consequence of the appreciation of investments the amount is over $25,000 higher than in the 1949 report (SCIENCE, 113, 563 [1951]), and the amount available for research grants and other Association-sponsored activities is up $2,500, to $20,522.14. Although judicious investment policies and management help, they are not substitutes for new additions to the investment funds, and it is hoped members will give thought to ways and means of increasing the Association's endowment.

The auditors' statements follow:

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
OPERATING FUND
BALANCE SHEET AS AT DECEMBER 31, 1950

Assets

Current assets			
Cash		$263,203.87	
Accounts receivable		19,412.86	
U. S. Treasury bills		298,964.00	$581,580.73
			$581,580.73

Liabilities

Current liabilities			
Accounts payable			$ 25,836.70
Deferred income			
Prepaid dues and fees		$202,990.51	
Prepaid journal subscriptions		49,011.49	252,002.00
Unallocated funds (net worth)			
Balance January 1, 1950		$208,289.16	
Add: Excess of receipts over expenditures		123,722.07	
		$332,011.23	
Deduct: 1950 SCIENCE annuity	$16,643.04		
Inflation allowance on annuity	11,626.16	28,269.20	
Balance December 31, 1950			303,742.03
			$581,580.73

Note: The journal SCIENCE was acquired in 1944 at a stated cost of $166,430.69, payable over a period of ten years, together with such additional as may be determined each year under the inflation clause of the contract. Total payments to December 31, 1950, amounted to $174,492.42. No liability has been shown on the above statement for the balance of $50,854.03 which is payable on the stated cost price of the journal. The amount due under the inflation clause on the balance of the contract computed at the 1950 rate would amount to $35,524.58. (Computed at the 1951 rate, the additional would amount to $42,783.50, making a total of $93,637.53 as a liability against the balance of unallocated funds.)

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
OPERATING FUND
STATEMENT OF RECEIPTS AND EXPENDITURES FOR THE YEAR ENDED DECEMBER 31, 1950

Receipts			
Dues and entrance fees			$266,986.96
Journals			
Subscriptions			
From Treasurer's accounts (life, 50-year, and emeritus members)	$ 2,619.00		
Members special subscriptions	15,166.93		
Nonmember subscriptions	57,935.01	$ 75,720.94	
Advertising		148,342.91	
Miscellaneous sales		3,243.65	227,307.50
Publications			
Binders		$ 1,271.66	
Symposium volumes		15,378.55	
Proceedings and directory		872.65	17,522.86
Cleveland meeting and exhibit			41,315.10
Rental income			3,120.74
Income from investments			3,105.47
Miscellaneous			549.55
			$559,908.18

Expenditures		
Administrative and general expense	$ 54,366.53	
Building expense	5,941.94	
Executive Committee	4,354.70	
General Secretary	2,189.09	
Allowance to divisions	5,870.00	
Section expense	2,590.68	
Circularization—new members	17,189.15	
Meetings and exhibits	34,486.63	
Journals	271,612.56	
Publications	28,174.68	
Employees' retirement plan	8,141.18	
Miscellaneous	1,268.97	436,186.11
Excess of Receipts over Expenditures		$123,722.07

Washington, D. C.
October 2, 1951

To the Council of the
American Association for the Advancement of Science
Washington, D. C.

We have examined the balance sheet of the Operating Fund of the American Association for the Advancement of Science as at December 31, 1950, and the statement of receipts and expenditures for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements as supplemented by the notes thereto present fairly the financial position of the Operating Fund of the American Association for the Advancement of Science as at December 31, 1950, and the results of its operations for the year then ended.

G. P. Graham & Company
By H. A. O'Neill

American Association for the Advancement of Science
Treasurer's Accounts
Balance Sheet as at December 31, 1950

Assets

Endowment and reserve funds			
Cash awaiting investment (overdraft)		$(16,891.89)	
Securities		289,075.66	$272,183.77
Building fund			
Cash		$ 14,653.75	
Securities		12.50	
Real estate			
1515 Massachusetts Avenue	$59,334.15		
Other	93,963.05	153,297.20	167,963.45
Current funds			
Cash			25,428.43
			$465,575.65

Liabilities and Reserves

Endowment and reserve funds			
For research		$121,066.15	
For general purposes		104,173.75	
For special purposes		9,025.00	
Treasurer's reserve fund		37,918.87	$272,183.77
Building fund			167,963.45
Current funds			
Liabilities			
Thousand Dollar Prize fund	$ 1,000.00		
Academy grants	3,097.05		
Special academy grants	200.00		
Westinghouse Science Writers' Award fund	555.74		
AAAS–Unesco fellowship fund	53.50	$ 4,906.29	
Unappropriated income			
For research	$ 4,921.44		
For general purposes	4,255.69		
Jane M. Smith fund	541.71		
Luella A. Owen fund	22.42		
A. G. Stillhamer fund	806.56		
Unexpended balances of previous years	9,974.32	20,522.14	25,428.43
			$465,575.65

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

TREASURER'S ACCOUNTS

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1950

Cash balances January 1, 1950			**$ 33,182.22**
Receipts			
Endowment and reserve funds			
Life membership fees	$ 2,250.00		
Income added to reserve fund	694.43		
Redemption and sales of securities	247,891.30		
Gift—Friends of the Association	6.50	$250,842.23	
Building fund			
Contributions		25.00	
Current fund			
Contributions for special academy grants	$ 400.00		
Thousand Dollar Prize fund	1,000.00		
Westinghouse Science Writers' Award fund	7,009.95		
Income from investments	10,242.35		
Deceased emeritus life membership fees	250.00	18,902.30	269,769.53
			$302,951.75
Disbursements			
Endowment and reserve funds			
Fees of deceased emeritus life members transferred to Jane M. Smith fund income	$ 250.00		
Securities purchased	263,162.75	$263,412.75	
Building fund			
Architect's fees for drawings, etc.	$ 754.48		
Miscellaneous expenses	162.26	916.74	
Current fund			
Westinghouse Science Writers' Award fund	$ 6,944.26		
Thousand Dollar Prize fund	1,000.00		
Income allocated to Treasurer's reserve	694.43		
Special academy grants	700.00		
Academy grants	2,246.00		
Emeritus life members (income—Jane M. Smith fund)	900.00		
Journal subscriptions (life, 50-year, and emeritus members)	2,619.00		
Expenses	328.28	15,431.97	279,761.46
Cash balances December 31, 1950			
For investment (overdraft)		$(16,891.89)	
For building fund		14,653.75	
For current purposes		25,428.43	$ 23,190.29

Washington, D. C.
October 2, 1951

To the Council of the
American Association for the Advancement of Science
Washington, D. C.

We have examined the balance sheet of the Treasurer's accounts of the American Association for the Advancement of Science as at December 31, 1950, and the statement of cash receipts and disbursements for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying financial statements present fairly the financial position of the Treasurer's accounts of the American Association for the Advancement of Science as at December 31, 1950, and the cash receipts and disbursements for the year then ended.

G. P. GRAHAM & COMPANY
By H. A. O'Neill

AAAS Membership

1. *Changes during 1951*

New members		6,174
Deaths	324	
Resignations	1,726	
Automatic resignations	2,406	
Total outgoing		4,456
Net increase during 1951		1,718

2. *Totals as of 31 December 1951*

Paid for 1951	34,016
Paid through June 1952	9,191
Life members, etc.	625
In good standing	43,832
In arrears	3,118
	46,950
New for 1952	1,543
Total membership	48,493

Public Information at Philadelphia

Sidney S. Negus
Director of Public Information

NEVER before for any annual meeting of the AAAS have the authors of papers been more cooperative with the Association's department of public information than for the Philadelphia convention. Nearly 1500 papers were listed on the programs of the 18 AAAS sections and subsections and the cooperating 71 organizations; 81% of them were available to reporters for the world press, radio, and television either as abstracts or as complete papers well in advance of presentation. This fact is rather good evidence that most productive scientists today no longer recoil at the thought of using the dignified methods of public information departments of scientific societies to inform the public about their research.

With human nature what it is, no one—not even a scientist—abhors mention of his work in the press or over the radio or television, *if it is favorable*. The words in italics are obviously the crux of the matter. The Association's department of public information has won the confidence of the majority of scientists in its programs, because they know it relays *directly* to competent reporters abstracts or complete papers of their contributions well ahead of each meeting, so that racing to meet a deadline, which may result in inadequate or inaccurate reporting, is avoided. No intermediary "handouts" are prepared by Association personnel. The reporters, as a general rule, prefer to write their reports directly from the abstracts or complete papers submitted by the authors. They often seek interpretation or amplification from authors or other qualified specialists in the respective fields. These specialists are always available to the press room at any Association meeting, and press conferences are arranged whenever requested by reporters. Obviously, a more accurate report of a paper can be prepared in this way than if reporters get their sole information about it by listening to the author report his findings at a scheduled meeting. The method outlined above has been in operation by the Association since Austin H. Clark initiated the service in 1924. If a paper is reported accurately from material submitted by the author himself, the results are invariably favorable to the author.

The secretaries of sections and subsections and the various program chairmen constitute a tremendously important link in the chain having to do with assembling papers prior to an Association meeting. Cooperation on the part of these officers was so complete and effective for the Philadelphia meeting that the Association's department of public information had obtained from them, approximately seven weeks ahead of the convention, the names and addresses of participants on 95% of the programs of the 248 sessions, together with titles of their papers.

About half the battle to secure world-wide coverage of an annual AAAS meeting is won when those on the program cooperate in sending copies of their papers to a central office. The other half has to do with convincing radio station managers, managing editors, and reporters that the meeting will be newsworthy enough to cover and that good facilities will be available for the six days of hard work. Over the years, members of the National Association of Science Writers and other accredited reporters have found from experience that there is an abundance of news to be obtained at a AAAS meeting, either directly from papers on the program or indirectly from interviews with attending scientists in all branches of science. Information obtained from such interviews is used for immediate release by the press, radio, and television or is made the basis of feature stories after the meeting is over. Since the AAAS is by far the largest and most influential group of related scientific organizations in the world, its annual meeting has evidently become a "must" for the top science writers of the nation. The New York meeting in 1949 was covered by 252 reporters for the press, radio, and television; the Cleveland meeting in 1950, by 148; and the Philadelphia meeting, by 162. Always in attendance are representatives from all press associations here and abroad, radio and television networks, most scientific and popular magazines, Unesco, publishing houses, local newspapers and other leading newspapers in America and abroad, schools of journalism, the U. S. Department of State and other government agencies, and public relations departments of industry, government, universities, and scientific societies. In addition, many free-lance writers are present.

Good working facilities for representatives of the press, radio, and television at a national meeting as large and diversified as a AAAS annual convention are obviously imperative. The arrangement of such facilities depends in large measure upon the members of the local public information committee. For the Philadelphia meeting, this committee was ably headed by Steven M. Spencer, associate editor of the *Saturday Evening Post* and former president of the National Association of Science Writers. Since the meeting, unusually favorable comments concerning this part of the Association's public information service have been received from those who reported the news in print and over the air. Headquarters for the service was the Junior Ballroom of the Bellevue-Stratford Hotel. It was fully equipped with everything necessary to meet the demands of reporters. Thanks to Bennett E. Tousley, vice president and manager of this headquarters hotel, everything needed by this department was supplied quickly and cheerfully by

his hospitable assistants. With Mr. Tousley's compliments, luncheon was served in the press room for three days of the meeting. The Westinghouse Educational Foundation was host to the reporters at a luncheon on one of the days of the convention, and the American Tobacco Company Research Laboratory on another day. The General Electric Company held open house for all science reporters each evening of the week. The Harvard Club of Philadelphia made its quarters in the hotel available for conferences. Scouts representing the Boy Scouts of America, Philadelphia Council, served as messengers, and students of the Temple University School of Business and Public Administration acted as assistants to the three press room secretaries. Bernard A. Bergman, of Publicker Industries, Inc., and other members of the Philadelphia Public Relations Association were helpful in many ways. Marjorie R. Carmosin, publicity director for Drexel Institute of Technology, did an outstanding job as our assistant in radio and television reporting. She arranged 42 programs, some of which were on the air from coast to coast. We are especially grateful to those who took part in these broadcasts.

Because of the splendid cooperation of authors of papers, section and society secretaries and program chairmen, members of the local public information committee, assistants in the press room, and many others, our long-time, competent friends—the news reporters—must have felt constrained to reciprocate by filing sheaves of copy. Requests for additional information about the meeting are now being received from all over the world. In the last analysis, our especial appreciation must be given the reporters who covered the meeting. It is they who ultimately make it possible for the Association to carry out one of its principal purposes: "To increase public understanding and appreciation of the importance and promise of the methods of science in human progress."

A Report of the Philadelphia Meeting December 26–31, 1951

Raymond L. Taylor

Assistant Administrative Secretary, AAAS

THE return of the American Association for the Advancement of Science to Philadelphia, where it was founded more than one hundred years ago, was considerably more than a pleasant, commemorative occasion. In many respects the Association's seventh Philadelphia meeting was one of its most significant annual conventions.

A scientific meeting is deemed a success if the programs are good, if it is well attended, and if its major objectives are realized. By these criteria the 118th meeting was a success: In the number, variety, and quality of the symposia, in the excellence of the special sessions and of the contributed papers, few if any other meetings of the Association have surpassed it. In the number of paid registrations, this was the largest meeting ever held in Philadelphia[1]—and only four other meetings have been larger in this respect. The convention brought together highly trained men and women of diverse disciplines to consider matters of general concern to them as scientists; it provided facilities for the meetings of specialists, and opportunities for the participation of the general public. Throughout the world, because of the excellent press coverage, public attention was directed to the importance of science and to its latest advances.

An important adjunct to scientific meetings—and a measure of their success—are the banquets or dinners arranged by sections and participating societies. In price, menu, and the speaker's after-dinner remarks, these can range from those that are sad and best forgotten to affairs that are pleasant and memorable. At the seventh Philadelphia meeting there were many particularly enjoyable meal functions. It was the writer's good fortune to attend the Botanists' Dinner, held under the auspices of Section G. It had been arranged by John M. Fogg, Jr., not in his capacity as vice provost of the University of Pennsylvania or as chairman of the Subcommittee of Physical Arrangements, but as a botanist in residence. For "technical reasons," the dinner originally limited to 75 had seatings increased to nearly 100; after dessert, another 25 or so were admitted to hear the introductory remarks of Stanley A. Cain and the talk of Ivey F. Lewis, retiring vice president of Section G. This traditional vice-presidential address was both an important summary of biological principles and their inescapably grim applications to man, and Dr. Lewis at his best as a raconteur.

Planning the meeting. Those who attend the sessions of a large scientific meeting, unless they have shared the experience of making some of the arrangements, may not realize the vast amount of planning and work required. The cooperation and services of many individuals are essential. The convention city is usually decided upon several years in advance, and only after a preliminary survey indicates that the physical facilities are adequate and generally satisfactory.

Early in the year of the meeting the session rooms are catalogued by capacities, relative desirability, provisions for darkening, need for microphones, the general furnishings, and location of black-out switches and obstructing pillars. Very early in the spring the secretary of each section and society must estimate the probable number of sessions and the attendance to be expected at each. Soon afterward, headquarters hotels for related societies are decided upon, and all meeting rooms are

[1] The registration totals for the sixth Philadelphia meeting (1940) and for the fifth Philadelphia meeting (1926) were 3339 and 3181, respectively.

tentatively assigned. The general formula is to place the largest of the sectional meetings in the auditorium and to locate the larger societies with concurrent sessions in the hotels with the greatest number of session rooms. Societies that meet with the AAAS usually may choose between session rooms in a hotel, on a campus, or a combination of both; their preferences for particular hotels can in general be met. In Philadelphia, the 1200-room Benjamin Franklin Hotel was the choice of the four zoological societies. Representatives of the three science-teaching societies chose the Hotel Adelphia. The Hotel Bellevue-Stratford was made the headquarters hotel of the Association, and it had the greatest concentration of the programs of the remaining sections and other participating societies. Here were held the annual lectures of the Society of the Sigma Xi and of the Scientific Research Society of America, and the AAAS Presidential Address and Reception. At the outset, laboratory facilities in the Medical School of the University of Pennsylvania were set aside for the demonstration sessions of the zoologists. As the programs developed, sessions were scheduled for other rooms on the campus, in the John Bartram, Ritz-Carlton, and Sylvania hotels, and at the Academy of Natural Sciences of Philadelphia, the American Philosophical Society, The Franklin Institute, and the University Museum. The annual lectures of the National Geographic Society, the United Chapters of Phi Beta Kappa, and the Honor Society of Phi Kappa Phi were scheduled for the Irvine Auditorium of the University of Pennsylvania. Here also was held the special two-session panel discussion, "Foods and People," arranged by Gove Hambidge.

The Local Committee. The interest and aid of key citizens of the city that has invited the Association to convene also must be enlisted early in the year if the meeting is to succeed. The Association was more than ordinarily fortunate in the acceptances of Edward Hopkinson, Jr., of Drexel & Company, and James Creese, president of Drexel Institute of Technology, as honorary general chairman and general chairman, respectively.

Three subcommittees made substantial contributions of their time and energy. The Subcommittee on Exhibits, headed by Hugh W. Field, vice president and general manager of Atlantic Refining Company, aided greatly in securing the participation of local industries in the exposition—indeed, to such an extent that no subcommittee on finance was necessary. The Subcommittee on Local Public Information, composed of talented specialists in all fields, and with Steven M. Spencer, associate editor of the *Saturday Evening Post*, as chairman, ably publicized the meeting locally through a diversity of media, including radio and television. The Subcommittee on Physical Arrangements, with John M. Fogg, Jr., as chairman, was drawn from appropriate persons in the educational and scientific institutions of Philadelphia. It did an outstanding job in collecting 116 pieces of projection equipment from some 40 sources, distributing it and such other equipment as screens, extension cords, spare lamps, chart hangers, etc., to the 46 rooms where the 248 sessions were held. This committee also provided and supervised all projectionists except in the Auditorium, where professional operators were employed. An Executive Committee of 20, with Dr. Creese as chairman, included the chairmen of the three subcommittees and the heads of many local industries; Allen T. Bonnell, vice president of Drexel Institute, was its efficient secretary. The debt of the Association and of those who attended the 118th meeting to these men is great indeed. The General Reception Committee, of more than 150, included all those mentioned and many other heads of institutions and companies in the Philadelphia area. The officers of the Association and its 18 sections still recall most pleasantly the dinner given by the General Committee just preceding the AAAS Presidential Address.

Physical arrangements. All conventions of all organizations must be adapted to existing local conditions. In Philadelphia, the Auditorium, although nearly two miles from the downtown hotels, was adjacent to the University of Pennsylvania campus and not too difficult to reach by bus, street car, or taxi. Also, special buses were operated. Sizable session rooms in the Auditorium were few, and it was decided to convert the four corners of the large downstairs hall into separate session rooms. Too late, it was learned that neither the hall management nor the decorator had sufficient sound-muffling fireproof material to extend to the ceiling for the four rooms; and eight-foot partitions of the same thin draping material used in the exposition would not have screened out light or sound, and thus would not have been worth their cost of more than $1.00 per running foot. Instructions were given to dim the whole floor as much as possible and to use the most brilliant of the stereopticon lanterns. Unforeseen, however, were the applause between papers that interrupted speakers in the other corners, and the loquacity of the coat checkers. The improvised arrangements proved unsatisfactory, and apologies are due the botanists, dentists, geologists, geographers, and pharmacists, all of whom had just cause to be irritated. This particular expedient will be avoided hereafter.

The projection equipment, some of it brand-new, was lent by the University of Pennsylvania, Temple University, the School District of Philadelphia, the Bell Telephone Company of Pennsylvania, and the Philadelphia Electric Company. Projectionists in the Municipal Auditorium were professional union operators; nearly all those in the hotels were students, screened for their experience.

Housing and registration. The Housing Bureau was operated by the Philadelphia Convention and Visitors Bureau. Since only two instances of error or nonreceipt of confirmations were reported, it may be assumed that it functioned well. The registration clerks, also furnished by the Convention Bureau, were hard-working and pleasant, though not always adequately informed on all aspects of so complex a meeting. The Visible Directory of Registrants, as always, was much consulted. Since 1949, it has been possible to interpolate names in perfect alphabetical order throughout the meeting period. Upon occasion, however, registration slips can be misfiled or, more commonly, registrants will overlook their own names.

Attendance. The actual attendance at a AAAS meeting can never be more than a close estimate, because practically all the sessions, especially the evening lectures, are open to the public. One useful index of attendance, however, is the paid registrations. The detailed registration slips, taken from the Visible Directory, permit analyses of the home states and fields of interest of the registrants.

The number of registrants was 3702. This figure is particularly impressive when it is considered that the 3339 registrants of the 1940 AAAS meeting in Philadelphia were there to attend annual meetings of their own societies. This was true of the physicists, astronomers, entomologists, parasitologists, botanists, phytopathologists, geneticists, and horticulturists, none of whom held their annual meetings with the AAAS in

1951. From Table 1 it will be noted that, as in 1950, every state in the union was represented, with the sole exception of Nevada (which, however, always has proportionately good representation at the June meetings of the Association's Pacific Division).

TABLE 1

DISTRIBUTION OF REGISTRANTS BY STATES

Pennsylvania	1171	Minnesota	17
New York	510	South Carolina	17
New Jersey	343	Louisiana	15
Maryland	203	New Hampshire	14
District of Columbia	185	Alabama	13
Massachusetts	179	West Virginia	12
Illinois	115	Kentucky	11
Ohio	102	Vermont	11
Virginia	90	Colorado	10
Michigan	79	Nebraska	10
Connecticut	73	Maine	8
Delaware	71	Mississippi	8
Indiana	59	Washington	8
North Carolina	43	New Mexico	4
Tennessee	37	South Dakota	4
Florida	36	Montana	3
Texas	30	Oklahoma	3
California	27	Wyoming	3
Missouri	26	North Dakota	2
Rhode Island	26	Utah	2
Iowa	21	Arizona	1
Kansas	21	Arkansas	1
Wisconsin	20	Idaho	1
Georgia	19	Oregon	1
		TOTAL	3665

There were 37 registrants from outside the continental United States: 20 from Canada; two each from Brazil, Italy, and Puerto Rico; one each from Alaska, Cuba, East Africa, England, France, Germany, India, Norway, Thailand, Uruguay, and Venezuela.

The second index of total attendance at a AAAS meeting is the number of complimentary admission tickets to the Annual Exposition of Science and Industry, which are (1) distributed to members of scientific and professional groups who request them, either directly from the AAAS or through their local societies; or (2) given to exhibitors to send to preferred potential customers and to key members of their own organizations. The total number of tickets given out by the AAAS each year averages 10,000, about 40% of which may be filled out with sufficient information about the user for analysis of subject interests. At Philadelphia the system of metering all those who had complimentary cards of admission, or ensuring that their names, addresses, and fields of interest were properly recorded, could not be enforced. Nevertheless, a substantial number of such cards, completely filled out, was available at the end of the meeting. The fields of interest on these cards have been combined with those of the 3702 registrants (Table 2).

Subject fields are not as readily analyzed as geographical data. Some registrants may list as their field of interest a narrow research specialty, whereas others may name two or more major sciences. In the first case, it is nearly always possible to tabulate the specialty under a broader scientific field and, in the second instance, it seems safe to assume that the field first named is the primary interest. It will be noted that the biological sciences, collectively, and the medical sciences, together, comprised about half the attendance at the 118th meeting; the physical sciences between one fifth and one quarter; and the engineering and the social sciences each close to one tenth.

TABLE 2

SUBJECT FIELDS OF ATTENDANCE AT THE SEVENTH PHILADELPHIA MEETING

Physical sciences		22%
Physics	345	
Chemistry	484	
Geology	176	
Engineering	413	9%
Biological sciences		27%
Botany	235	
Zoology	545	
Other Biology	448	
Medical sciences		21%
Dentistry	140	
Pharmacy	102	
Other Medicine	739	
Social sciences and Education	436	9%
General	530	12%

Whether these proportions are typical of all AAAS meetings is a natural question, which cannot be answered definitely for want of sufficient data over a period of years under varying conditions. It is believed, however, that, within the broad classifications used, and for the next few years, these percentages will not vary greatly. Since the Association meets in large cities that contain one or more large institutions of higher learning, medical schools, experiment stations, and industrial laboratories, a good-sized local and regional attendance is assured at the outset. Under normal conditions, therefore, a AAAS meeting can be expected to have 2500–4500 registrants, plus an additional number of local professional people totaling 1.6 times the number of registrants—or a minimum attendance of 4000 and a potential maximum of 12,000.

For section secretaries and other program chairmen who want their programs and symposia to be well attended, there is a simple formula for success: (1) Invite the advice of the entire section committee (and perhaps others) regarding the subject about which those in that field would most like to hear; (2) very early in the year (before other engagements may have been made) invite the recognized authorities to participate, indicating at the outset the scope of the symposium and the names of the others who are being asked; (3) secure firm commitments by June 1, in time for appropriate scientific journals to announce the program; (4) send mimeographed or other announcements to every department or laboratory that has faculty, researchers, and students who should hear the symposium (rather than read it), meet the speakers, perhaps contribute to the discussion at the session.

Significance of the meeting. The 118th meeting was important on more than one count. The two general Association symposia were out of the ordinary in their significance. The symposium on "Soviet Science" was concerned with an objective appraisal of the quality of science in the Soviet Union today. The widely sponsored three-session symposium, "Operation Knowledge," near the end of the meeting, focused attention upon deficiencies in the communication of concepts, in all media, in today's complex society. It will be reported on separately by Dr. Hewitt, who arranged it. The general excellence and large number of the sectional symposia have been mentioned; reports of the secretaries will be found on succeeding pages.

The special sessions—outstanding general addresses and evening lectures by eminent authorities, sponsored

jointly by the Association and organizations that meet regularly with the AAAS—met the high standard of previous years. In chronological order, these were: The annual address of the Society of the Sigma Xi, on "Animal Light," given by E. Newton Harvey, Henry Fairfield Osborn professor of biology, Princeton University; the annual address of the Scientific Research Society of America, "The Human Element in Industrial Research," given by E. W. Engstrom, vice president in charge of research, Radio Corporation of America; the annual illustrated lecture of the National Geographic Society, "An Ornithological Expedition to Nepal," delivered by S. Dillon Ripley, Peabody Museum, Yale University; the one hundredth AAAS Presidential Address, "Man's Synthetic Future," given by Retiring President Roger Adams; and the annual address of the United Chapters of Phi Beta Kappa, "Science and Man's Destiny" (a change from the title printed in the program), by Arthur H. Compton, president of Washington University. The final special session was the revival of an annual address by the Honor Society of Phi Kappa Phi. Cornelus W. de Kiewiet, president of the University of Rochester, spoke on "Our Human Resources of Skill and Wisdom" before a small but enthusiastic audience.

In 103 years, the American Association for the Advancement of Science has grown from two sections, Natural History, Geology, etc., and General Physics, etc., to 15—one of which, N, Medical Sciences, has three subsections: Nd, Dentistry; Np, Pharmacy; and Nm, Medicine. At the 1951 meeting, for the first time in many years, a new section was established. Section P, Industrial Science, was formally inaugurated Friday morning, December 28, with President-elect Detlev W. Bronk presiding. The launching of this new section, which already has two affiliated societies—the American Industrial Hygiene Association and the Society for Industrial Microbiology—would itself make the 118th meeting a memorable one.

AAAS Science Theatre. Some 61 foreign and domestic scientific films, from almost as many sources, were shown during four days of the meeting in 10 four-hour programs, and were most appreciatively received. At all times observed, the attendance ranged from 100 to 350. The Association again expresses its appreciation to those who so kindly lent such excellent films.

Annual Exposition of Science and Industry. The AAAS Annual Exposition of Science and Industry has become an important and integral part of the association's annual meeting and provides an outstanding opportunity for those who use the tools and materials of science, and those who produce and distribute them, to meet each other. The 1951 exposition, with some 155 booths, filled the entire arena of the Philadelphia's Municipal Auditorium. Exhibits included the latest and best in scientific books, instruments, and materials. In addition to the "core exhibitors," there were technical exhibits by large firms representative of the basic industries of the nation. Table 3 gives the final list of exhibitors.

TABLE 3

Books, Maps, and Publications

AAAS: SCIENCE, THE SCIENTIFIC MONTHLY
Academic Press Inc.
Aero Service Corporation
Association of American University Presses
Biological Abstracts
The Blakiston Company
Encyclopaedia Britannica, Inc.
Folkways Records & Service Corporation
Gerontological Society, Inc.: *Journal*
D. C. Heath and Company
Houghton Mifflin Company
Interscience Publishers, Inc.
Lea & Febiger
The Macmillan Company
Josiah Macy, Jr. Foundation
McGraw-Hill Book Company, Inc.
G. & C. Merriam Company
The C. V. Mosby Company
National Geographic Society
Oxford University Press, Inc.
Philosophical Library
Prentice-Hall, Inc.
The Ronald Press Company
W. B. Saunders Company
Science Library

Medical

American Cancer Society
Armour and Company
Children's Hospital of Philadelphia (space endowed by Smith, Kline & French Laboratories)
Difco Laboratories, Inc.
Jefferson Medical Hospital (space endowed by SKF Industries, Inc.)
National Cancer Institute, USPHS, Dr. Heuper (space endowed by the Warner Company and the Link-Belt Company)
National Society for Medical Research
Sanborn Company
Schering Corporation
Sharp & Dohme, Inc.
Sugar Research Foundation, Inc.

Instruments, Laboratory Equipment, and Scientific Supplies

Ace Glass Incorporated
American Electronic Laboratories, Inc.
James A. Biddle Co.
Biophysical Instruments, Inc.
C. A. Brinkmann & Co.
Cambridge Instrument Company, Inc.
Carolina Biological Supply Company
Fred S. Carver, Inc.
Custom Scientific Instruments, Inc.
El-tronics Inc.
General Chemical Division, Allied Chemical & Dye Corporation
Harford Metal Products, Inc.
Heitz & Lightburn—Training Films, Inc.
Jarrell-Ash Company
Keystone Plastics Company
Leeds & Northrup Company
Linguaphone Institute
New Brunswick Scientific Company
Norwich Wire Works, Inc.
Nuclear Instrument & Chemical Corporation
Nuclear Research Foundation
Phipps & Bird, Inc.
RCA Victor Division, Radio Corporation of America
Specialized Instruments Corporation
Arthur H. Thomas Company
W. M. Welch Manufacturing Company
Henry Wild Surveying Instruments Supply Co. of America, Inc.

Microscopes and Accessories

American Optical Company
Bausch & Lomb Optical Co.
Edmund Scientific Corporation
Ercona Corporation—Carl Zeiss, Jena Products
R. Y. Ferner Co., Inc.

The Graf-Apsco Co.
E. Leitz, Inc.
The Rayoscope Company

Special Exhibits

AAAS Annual International Photography-in-Science Salon
American Documentation Institute
Animal Welfare Institute
City Planning Commission of Philadelphia
The Coca-Cola Company
Community Chest of Philadelphia (space endowed by Publicker Industries, Inc.)
Cooperative Bureau for Teachers
The Franklin Institute (space endowed, in part, by The Midvale Company)
The Human Resources Research Center
Library of Congress, Navy Research Section
National Bureau of Standards
Naval Research Laboratory and Naval Ordnance Laboratory

Technical Exhibits of Industries

The American Tobacco Company
The Atlantic Refining Company
Atlas Powder Co.
The Bell Telephone Company of Pennsylvania
The Chemstrand Corporation
Dodge Steel Co.
E. I. du Pont de Nemours & Co., Inc.
General Electric Company
Hercules Powder Company
Koppers Company, Inc.
The Kuljian Corp.
Monsanto Chemical Company
Philip Morris & Co. Ltd., Inc.
Philadelphia Electric Company
Philco Corporation
Polaroid Corporation
Proctor & Schwartz, Inc.
Rohm & Haas Company
Socony-Vacuum Oil Company, Inc.
Westinghouse Electric Corporation

Reports of Sections and Societies[1]

THE Association sponsored two general symposia, "Soviet Science" and "Operation Knowledge." The two sessions devoted to a critical but dispassionate survey of the genetics, physiology, pathology, psychology and psychiatry, mathematics, physics, chemistry, soil science, and social science in the USSR drew capacity audiences and attarcted such widespread interest that plans are being evolved for early publication of all the papers presented. Conway Zirkle, of the University of Pennsylvania, vice president of the AAAS and chairman of the Section on the History and Philosophy of Science (L), arranged the program and is assembling the material for publication.

William F. Hewitt, Jr., of Howard University, who organized the symposium on "Operation Knowledge," reports that the three sessions of this general AAAS symposium were attended by 50–100 persons on December 30 at Convention Hall. The 14 papers covered several aspects of science communications: primary publication, abstracting services, hindrances to and promotion of international movement of scientists, an international language for Western science, cooperative intramural communications groups in colleges, universities, and professional schools, a proposed society of communications scientists, the scientific education of laymen, the nature of documentation in general and its advancement by libraries, by the American Chemical Society, and by the American Documentation Institute. Academic, industrial, and governmental speakers took part. Luther Evans, librarian of Congress, presided in the afternoon when Detlev Bronk was unexpectedly called away. Returns are still coming in from the questionnaire distributed by Samuel Miles, inquiring about interest in a comprehensive organization of scientists concerned with communications. Members of the audience expressed their conviction that communications constitute a fundamentally appropriate and extremely important area for general AAAS discussion and activity, and their hope that future programs will include integrative discussions of specific aspects of communications.

[1] Key symbols correspond to those in the General Program.

Section on Physics (B)

Three meetings were held on December 27. In the morning a conference was devoted to the problems of maintaining "Physical Research in the Universities." Urner Liddel discussed the "Forces Affecting the Research Trends in Physics." This was a forthright analysis of the problems of government support and the preservation of individual imagination and initiative in basic research. Norman F. Ramsey spoke on "University Physics in a Continuing National Emergency." On the basis of his experience with governmental enterprises in research and development, contrasted with the university to which he has returned, he discussed the role of the university in education and research, stressing the long-term importance of the universities' contribution to the strength of our nation. Lyman J. Briggs presided at an afternoon conference concerned with "Applied Physics," chiefly the activities in government organizations. Hugh L. Dryden gave a most interesting picture of the advances in aeronautical science under the title "The Role of Physics in Aeronautical Development." Thomas H. Johnson discussed the scope and nature of research in the field of "Physics in the Atomic Energy Program." Philip M. Morse described the concepts, methods, and growing importance of operational analysis under the title "Physics and Operations Research." He analyzed the role and contribution of physical thinking.

The affairs and the future of Section B were considered at a dinner meeting, at which Arthur H. Compton presided.

FREDERICK S. BRACKETT, *Secretary*

Oak Ridge Institute of Nuclear Studies (B2) Isotopes Division, U. S. Atomic Energy Commission (B3)

A three-part symposium on "Cancer Therapy with Radioisotopes" was sponsored by the Oak Ridge Institute of Nuclear Studies in its role as an associated society of the AAAS. Joining with the institute in sponsoring the symposium was the Isotopes Division of the U. S. Atomic Energy Commission.

The symposium was given in the ballroom of the Municipal Auditorium with morning, afternoon, and evening sessions on December 28. The six papers on the morning program were concerned with internally administered radioisotopes, and the five afternoon papers dealt with the use of radioisotopes as teletherapy units. The three papers on the evening session took a long view of radioisotopes and their implications in cancer research.

The consensus was that specific isotopes are of established value in treating specific types of cancer. The greatest value of radioisotopes in the field will continue to be as a research tool in determining the mechanism of the cancer process. Additionally, these materials from the atomic energy program may become outstanding adjuncts to diagnosis.

The major radioisotopes used internally are iodine, phosphorus, and gold—with gold^{198} coming up to a strong third place in therapy. L. A. Erf, of Jefferson Medical College, expressed the interesting view that leukemia may be a deficiency disease on the order of pernicious anemia and may yield to a treatment as simple as vitamin B_{12}. William H. Beierwaltes, of the University of Michigan, reported on the status of iodine therapy, and Gould A. Andrews, of the Medical Division at Oak Ridge, reported on the status of radiogold therapy. In discussing newer isotopes, H. D. Bruner, also of the Institute Medical Division, pointed to work done by Mueller (of Switzerland) and others in attaching radiogold to particles of varying sizes, thus obtaining highly selective radiation. He said that radioactive astatine, which appeared to behave as a halogen, had been tested and found to follow the course of iodine in a biologic system.

In other papers on the morning program S. Allan Lough, assistant chief, Isotopes Division, AEC, traced the growth of isotope use in cancer therapy, and J. A. Cox, superintendent, Pile Operations Department, Oak Ridge National Laboratory, noted the need of a high flux reactor to provide additional quantities and qualities of radioisotopes for medical use. Richard Chamberlain, of the University of Pennsylvania School of Medicine, led discussion of the morning papers.

The gist of the afternoon papers on teletherapy developments was that a number of radioisotopes can deliver the same radiation doses as radium or x-ray machines, with much greater economy, flexibility, and adaptability. Of those discussed, cesium, a fission product, seemed to offer unusual promise because of its long half-life (33 years) and desirable radiation characteristic (0.662 mev γ), as well as the fact that it is a fission product. (Cobalt, the isotope now in use for teletherapy, is produced by neutron irradiation and is expensive of the neutron economy.) Other isotopes discussed were cerium, iridium, and europium. It was pointed out that the high levels of radiation involved in preparing teletherapy sources from fission products require a considerable extension of present techniques and facilities before such sources can be made available. Max Cutler, Chicago Tumor Institute, who led the discussion on the afternoon program, predicted that the appearance of radioisotopes on the teletherapy scene would prove to be a powerful stimulus to radiation treatment of cancer.

At the evening session, Paul C. Aebersold, chief, Isotopes Division, AEC, traced the ascent of radioisotopes to their present position as one of the most powerful research tools in the medical field. A. H. Holland, Jr., medical director of Armour Laboratories, then outlined the responsibilities which the use of radioisotopes imposes on the physician using them, notably their potential ability to provide harmful side effects many years after therapy is discontinued, not to speak of possible genetic effects. Shields Warren, director of the Division of Biology and Medicine, AEC, speaking from the standpoint of administrator as well as pathologist, found in radioisotopes an exceedingly valuable new tool in cancer research, with a less valuable role in diagnosis and therapy. But, as Dr. Cutler pointed out, even a slight increase in efficiency over present treatment methods may be the difference between saving and losing a patient.

MARSHALL BRUCER, *Chairman*
Medical Division Oak Ridge Institute of Nuclear Studies

Section on Chemistry (C)

Section C sponsored or cosponsored 16 sessions, consisting of two sessions of submitted papers and the following symposia: two on improvement of soil structure, arranged by F. E. Bear and C. E. Millar; one on monomolecular layers, arranged by Harry H. Sobotka; three on "Operation Knowledge," arranged by William F. Hewitt, Jr., and moderated by Detlev W. Bronk, Kirtley F. Mather, and Samuel R. Powers; one on recent advances in catalysis, arranged by E. H. Riddle; two on recent advances in petroleum and petroleum technology, arranged by Alex G. Oblad and H. Heinemann; two on scientific evidence pertaining to the time of death, arranged by Samuel A. Levinson and Ralph F. Turner; two on stream pollution and industrial wastes, arranged by George G. Beal and W. B. Hart; and one on the chemistry of colchicine and 7-membered carbocyclic rings, arranged by Glenn E. Ullyot. The titles and authors of these various papers are listed in the General Program.

Among the papers presented but not listed in the General Program were: "The National Cooperative Undergraduate Chemical Research Program," by Ethaline Cortelyou; "The Age of Skeletal Remains," by William E. B. Hall; and "Problems of Duration of Interment of Human Skeletal Remains," by Wilton M. Krogman.

An unusual program is planned for the St. Louis meeting, December 26–31, with sessions for submitted papers on Friday and Saturday and symposia of various types on the "Contributions of Chemistry to Engineering and Industry" on the succeeding days. Authors interested in submitting papers are reminded that a prize of $1000 is awarded for one of the best papers presented at the AAAS meetings. Papers for Section C should be sent on or before September 1 to Ed. F. Degering, Secretary, Section C, Buckman Laboratories, Inc., 1256 N. McLean St., Memphis 7, Tenn.

ED. F. DEGERING, *Secretary*

Section on Astronomy (D)

The meeting of Section D was scheduled to follow the meeting of the American Astronomical Society in Cleveland. The program consisted of the address of the retiring chairman, C. D. Shane, and a symposium on techniques and instrumentation in astronomical photoelectric

photometry arranged by Frank Bradshaw Wood, of the University of Pennsylvania.

Dr. Shane's address, entitled "A Cosmic Census," was an account of some of the recent work with the 20-inch photographic telescope of the Lick Observatory of the University of California. The Rittenhouse Astronomical Society and the Amateur Astronomers of the Franklin Institute met jointly with Section D to hear this lecture, at which Harold L. Alden presided.

The symposium, held on the morning of December 31, had as speakers: A. P. Linnell (Amherst), J. S. Hall (U. S. Naval Observatory), W. Blitzstein (U. of Pennsylvania and Franklin Institute), Bengt Strömgren (Chicago), and A. E. Whitford (Wisconsin). Direct current, alternating current, and pulse-counting techniques were discussed by the first three speakers. Recent European developments were described by Dr. Strömgren, and Dr. Whitford summarized the symposium.

All sessions were held at the Franklin Institute, and thanks are due to I. M. Levitt, director of the Fels Planetarium, and John Streeter, assistant director, for the excellent arrangements that they provided.

FRANK K. EDMONDSON, *Secretary*

Section on Geology and Geography (E)

The sessions of Section E were held at the Philadelphia Municipal Auditorium and Bryn Mawr College, December 27 and 28. Approximately 200 individuals participated, with attendance varying from 30 to 80 at various sessions. The program included: general geology, two sessions, 13 papers; geography, two sessions, 11 papers; symposium on "The Nation's Water: Want, Waste, and Why," one session, three papers, six planned discussions; program on "Crystalline Rocks of the Appalachians," two sessions, 11 papers; program on "Foreign Petroleum Geology," two sessions, 12 papers; Section E smoker; and the vice-presidential address by Kenneth K. Landes. The geography program was organized by Meredith F. Burrill, the program on "Crystalline Rocks of the Appalachians," by Robert Balk and Leland Horberg; the program on "Foreign Petroleum Geology," by A. W. Weeks; and the symposium on water resources, by Jack B. Graham. The vice-presidential address and smoker were held at Bryn Mawr College, where the Department of Geology acted as host. Arrangements were made by E. H. Watson and A. W. Weeks and about 70 attended. A special program, including abstracts of papers, was made available by The Geological Society of America.

The regular section elections and council actions resulted in the election of the following: *vice president and chairman*, A. C. Trowbridge; *retiring vice president*, George W. White; and *elected Section Committee member*, Charles F. Deiss.

LELAND HORBERG, *Secretary*

National Speleological Society (E4)

The session of the National Speleological Society, which was held on Friday afternoon, December 28, was attended by approximately 25 persons, including both members of the society and nonmembers. Papers were presented by Charles E. Mohr, president of the society, William E. Davies, vice president in charge of scientific and technical activities, and Carl Gaum, of the Philadelphia Grotto.

Since neither William R. Halliday nor George W. Moore, both of whom are members of the Denver Grotto of the Society, were able to attend the session in person, it was necessary to have their respective papers read *in absentia*. Burton S. Faust, executive vice president of the society and chairman of the session, read Dr. Halliday's paper, and Mr. Moore's paper was read by Rudolph Gaum, of the Philadelphia Grotto.

It is desired to take this opportunity to express to the members of the Philadelphia Grotto on behalf of the Committee on Program and Activities, on behalf of the society membership as a whole, and especially on behalf of those who were fortunate enough to be able to attend the session, the most sincere appreciation for the arrangements for the meeting, for the enjoyable social hour and refreshments that followed the formal proceedings, and for their splendid assistance and cooperation in every possible manner.

At the meeting of the Executive Committee of the society, which was held the same evening, plans were further perfected and a tentative program outlined for the tenth annual national convention of the society, scheduled for April 18–20 of this year at the Hotel Alexander in Hagerstown, Md.

WM. J. FOSTER, *Member*
Program and Activities Committee

Section on Zoological Sciences (F)

Section F sponsored and cooperated in numerous symposia in biological and related fields. These meetings were on the whole extremely well attended, and in most cases the meeting rooms were filled to capacity. The Biologists Smoker may well be considered an outstanding success.

A marked cooperative spirit seemed to exist between the constituent societies and Section F. The scope of society and sectional activities in the field of zoology is amply demonstrated in the reports that follow.

J. H. BODINE, *Secretary*

Society of Protozoologists (F1)

It should be stated at the start that Society of Protozoologists was officially adopted as the name of the group previously called the American Society of Protozoologists, and the constitution and bylaws were approved at the business meeting on December 28. Eighty-nine new members were voted into the society, so that the total charter membership is about 300. The program of papers on December 27–29 included papers on nutritional requirements, synthesis, effect of antibiotics and other compounds, life-cycle, cytology, taxonomy, and host-parasite relationships, the first three subjects predominating. Notable was L. R. Cleveland's presentation of photomicrographs of certain living protozoa during division.

R. R. Kudo, of the University of Illinois, was elected president for the coming year. Harold Kirby was elected vice president; Reginald D. Manwell, treasurer; William Balamuth, member of the Executive Committee; and R F. Nigrelli, representative on the AAAS Council. The undersigned will continue for another year as secretary. Time and place of the next annual meeting will be determined in the near future.

E. R. BECKER, *Secretary*

The American Society of Zoologists (F2)

The meeting of the society held in Philadelphia December 27–30 was one of the best attended and most successful the society has ever held. At this meeting Franz Schrader was elected president, Viktor Hamburger, vice president, and S. Meryl Rose, secretary.

The 1952 annual meeting will be held on the Cornell University campus at Ithaca, N. Y., September 8–10, with other members of the American Institute of Biological Sciences. The Executive Committee decided to request the secretary to take a poll of the membership as a guide in the decision as to whether the 1953 annual meeting should be held with the AIBS in Madison, Wis., in September, or with the AAAS in Boston in December.

The call for papers for the 1952 meeting in Ithaca will be mailed to members about April 20. The deadline for the receipt of titles and abstracts will be June 1.

WALTER N. HESS, *Secretary*

The Society of Systematic Zoology (F4)

The fourth annual meeting of the society was by all criteria its most successful. It included a symposium, a session for papers, the annual breakfast and business meeting, and the lounge and book exhibit, which proved so popular last year.

The subject of the symposium was "The Classification of Animals." The speakers were Alfred S. Romer, Alan Boyden, and Th. Dobzhansky. More than 300 zoologists attended this interesting session.

The society's headquarters room was again opened to all zoologists as a lounge. More than 300 zoological books were on display, from general texts and reference books to specialized monographs and faunal studies. A special exhibit showed a complete set of the 50 zoological publications of the Smithsonian Institution in 1950 and 1951, including the "Miscellaneous Collections," the *Bulletin*, and the *Proceedings of the U. S. National Museum*. It is estimated that 500 zoologists visited the lounge and examined the books.

After the council meeting the detailed plans for the new journal *Systematic Zoology* were announced, and color proofs of the cover were exhibited. Publication is planned for March 1952.

A definite agreement was announced under which the SSZ will act as subscription agent for the *Zoological Record*. Orders for current and back numbers will be transmitted, with payment in dollars, through the society. All zoologists are urged to cooperate with the *Zoological Record* by subscribing to one or more sections.

Results of the election of officers were announced: *president-elect*, H. B. Hungerford, University of Kansas; *secretary-treasurer*, R. E. Blackwelder; *councillors 1952–55*, D. F. Hoffmeister and H. W. Manter. Alfred S. Romer is *president* for 1952, by automatic succession.

The widespread interest in systematic zoology is shown by the rapid growth of the society in only four years to pass its first goal of 1000 members.

The 1952 annual meeting was set for St. Louis with the AAAS, December 27–30. The society will also cooperate in other meetings whenever possible.

R. E. BLACKWELDER, *Secretary-Treasurer*

American Microscopical Society (FG1)

The sixty-eighth annual meeting of the society was held at the Benjamin Franklin Hotel, Philadelphia, December 27–29. The annual luncheon and business meeting of the Executive Committee convened Thursday noon, December 27, President David C. Chandler presiding.

On Friday afternoon a symposium of five excellent papers on the subject "Modern Methods for Microscopy II" attracted an interested audience, which varied between 50 and 95 people. Oscar W. Richards, who had served during the past year as program chairman, presided at the meeting. As indicated in the title, this was the second consecutive symposium on this general topic, the previous one having been presented by this society at its annual meeting in Cleveland December 29, 1950. A third program on the same general topic will constitute a part of the sixty-ninth annual meeting to be held during 1952.

At the annual business meeting, many details of society business were transacted, and the following officers for 1952 were elected: *president*, Frank E. Eggleton, University of Michigan; *first vice president*, G. W. Martin, University of Iowa; *second vice president*, Martin W. Johnson, Scripps Institution; *secretary-editor*, C. J. D. Brown, Montana State College; *elected member of Executive Committee*, T. L. Jahn, University of California, Los Angeles. The first three of the new officers serve for one year each; the secretary-editor and elected member of the Executive Committee, for three years each. Dr. Brown's and Dr. Jahn's terms will be 1952–54. In addition to these officers, the *treasurer* and the *custodian* continue in office through 1952, as do also R. V. Bangham and O. W. Richards, *elected executive committeemen*. A. M. Chickering and C. J. D. Brown were appointed as representatives of the society on the council of the AAAS for 1952 and 1953.

The society voted to meet at Ithaca, N. Y., in September 1952, with the AIBS, subject to completion of appropriate arrangements with that organization. Preliminary consideration was given to proposed changes in membership dues and subscription rates; to the consequent requisite changes in the constitution and bylaws of the society; to selection of a repository for historically valuable records and properties; and to the possible desirability of adding a historian-librarian to the list of elected officers. In recognition of the inherent nature of these items, the society instructed the new president to appoint committees to study each of the proposals and to report their recommendations to the society through the Executive Committee prior to the next annual meeting.

FRANK E. EGGLETON, *Secretary*

Eastern North American Region, Biometric Society (FG4)

On December 27 and 28 the Eastern North American Region of the Biometric Society held a meeting jointly with AAAS Sections A (Mathematics) and H (Anthropology) and the American Society of Naturalists at the Bellevue-Stratford Hotel. The three sessions arranged under the able direction of Chairman J. N. Spuhler and his committee were devoted to a review of mathematical biology, to statistics as applied to special biological problems, and to a symposium on "The Use of Statistical Models to Interpret Data on Human Population Genetics." The December 27 morning session was under the chairmanship of H. Levene and featured talks by N. Rashevsky, A. Shimbel, and G. Karreman. The afternoon session—the symposium—was headed by M. W. Smith and was devoted to papers by C. C. Li, J. V. Neel, B. Glass, and J. N. Spuhler and D. J. Hager, with a discussion by H. Levene. The Friday morning session was presided over by M. Whittinghill and featured papers by M. L. Clark and F. X. Lynch, and M. Skibinsky, with a discussion by J. A. Rafferty and R. E. Comstock.

WALTER T. FEDERER, *Secretary-Treasurer*

Section on Botanical Sciences (G)

For some years past Section G has had very short pro-

grams, but in any year that the botanical societies do not meet with the AAAS, the section program is expanded. This year there were 16 sessions, 74 papers and speeches, and a total of 75 different participants. Several sessions were cooperative. Joint sessions were held with sections C, F, and O, with the Botanical Society of America, the Ecological Society of America, the Philadelphia Botanical Club, and the Phycological Society of America; and a joint-session symposium of Sections F and G was cosponsored by the American Society of Protozoologists, American Society of Zoologists, Genetics Society of America, and Botanical Society of America. Five symposia in eight sessions were presented by Section G, one jointly with Section F, one with Sections C and O, one with the Botanical Society of America, and one with the Ecological Society of America. Two sessions of the Phycological Society of America were held jointly with Section G, as was the open meeting of the Philadelphia Botanical Club. The five symposia were on "The Use of Isotopes in Botany," arranged by Alexander Hollaender; "Improvement of Soil Structure;" "New Jersey Pine Barrens;" "Sex in Microorganisms," arranged by D. H. Wenrich; and "Foods and People," arranged by Gove Hambidge, the last being a panel discussion by representatives of ECA, TCA, FAO, and other agencies and institutions.

Four sessions were provided for the reading of 37 contributed papers. Since there has been some question raised as to the need for Section G to arrange sessions for contributed papers, it is of interest to record that the persons contributing papers represented 27 different institutions and came from 15 different states and the District of Columbia. Furthermore, the states represented were by no means restricted to the near-by Atlantic seaboard, for they included Michigan, Illinois, Minnesota, Arkansas, Colorado, Oregon, Washington, and California. At future meetings Section G will provide sessions for the reading of contributed papers to the extent that the AAAS membership requires.

In addition to the significant symposia that have already been mentioned, attention should be called to two important speeches. One was the special invitational lecture by D. I. Axelrod, University of California, Los Angeles, who spoke on "A Theory of Angiosperm Evolution," the other was the distinguished vice-presidential address given at the section banquet by Ivey F. Lewis, University of Virginia, on "Biological Principles and National Planning."

STANLEY A. CAIN, *Secretary*

Section on Anthropology (H)

In 1951 Section H held its largest meetings to date. Thirteen sessions, in which 74 persons participated, were held from Thursday, December 27, through Sunday morning, December 30. Eight of the sessions were joint meetings with the Society for Research in Child Development, the Society for American Archaeology (2), the Biometric Society: Eastern North American Region, the Eastern Division of the American Philosophical Association, the American Sociological Society, the Society for Applied Anthropology, and the University Museum of the University of Pennsylvania. Attendance at sessions ran from forty to three hundred persons.

The dinner, held on Saturday evening, was also well attended. Guests were drawn about equally from anthropology and philosophy, since a number of philosophers attending meetings at Bryn Mawr stayed over for the joint session in the afternoon and for the dinner. The presiding officer, George Boas, Philosophy Department of Johns Hopkins, was introduced by Clyde Kluckhohn of Harvard, chairman of Section H. Margaret Mead, of the American Museum of Natural History, gave the retiring vice-presidential address, citing data from her recent trip to Australia and underlining the importance of personal factors in the history of colonization.

Two excellent sessions were devoted to contributed papers. It is the section's policy to encourage such papers. Possibly, however, because of the fact that the meetings of other anthropological societies do not require as much advance notice as do the elaborate programs of the AAAS, many persons offered titles and abstracts too late for inclusion. It is hoped that this unfortunate situation may be corrected in the future, and it was noted with satisfaction that the anthropologists whose papers had to be excluded for lack of space on the program attended the meetings anyway.

As is usual in its meetings, Section H also gave prominence to symposia. Several of these centered upon cross-disciplinary contributions. Psychology and anthropology contributed jointly to "Sex Education and its Relation to the Sexual Behavior of Children and Young Adults;" and statistics, genetics, and anthropology joined in a symposium on the "Use of Statistical Models to Interpret Data on Human Population Genetics." Sociology and anthropology united in a discussion of "Social Structure;" and it is noteworthy, as Talcott Parsons, of Harvard, pointed out in his summation as chairman, that this subject was viewed by both disciplines from the vantage point of empirical data. Certain differences in the conceptual schema of anthropology and sociology exist, yet these were set aside, both in the papers and in the discussion from the floor, in favor of constructive and cooperative consideration of the subject at hand. Such an observation augurs well for the future of cross-disciplinary research—a type of research too often recognized more by intent than by practice.

Philosophy and anthropology contributed jointly to views upon "Cultural Relativism." Richard Brandt, of the Philosophy Department of Swarthmore, is to be particularly congratulated for the success of this symposium. One of the participants, Ralph Linton, of Yale, was unable to attend for reasons of health, but Dorothy D. Lee, anthropologist from Vassar, and Grace de Laguna, philosopher, of Bryn Mawr, were good enough to act as discussants of the papers by Clyde Kluckhohn and Phillip Blair Rice. Discussion from the floor and between the participants indicated the success of this arrangement.

The largest symposium of the Section H program covered five separate sessions. It dealt with "Prehistoric and Historic Asia and Transpacific Contacts with the New World." The problem of transpacific contacts, which has been of prime concern to anthropologists since the Jessup Expedition went to the northern Pacific in the last century, has recently been given popular appeal through the adventurous voyage of the *Kon-Tiki*. The symposium considered it from many angles: geographically from the Arctic, the Near East, India, and Latin America; chronologically from the Neolithic to the immediate present; and academically from the materials of archaeology, classical archaeology, ethnology, history, and botany.

Lauriston Ward, of Harvard, James B. Griffin, of Michigan, and J. Louis Giddings and Froelich Rainey, of Pennsylvania, helped immeasurably in the organization of the Transpacific symposium. Although it attracted

scholars from the West Coast, the session on modern Asian affairs had the poorest attendance of any Section H meeting. This may be variously explained. Two possible explanations—that scientists are little interested in international affairs and that Americans are little concerned with Asia—lead to a conclusion that is discouraging in the present state of world affairs. In actual accomplishment, however, the results of the symposium suggest the opposite prospect. The more technical sessions were probably the best received of any of the Section H offerings. Mr. Ward's sessions on the "Prehistory and History of Asia and the Near East" were so productive and so provocative, that he was asked by the participants and the audience to explore the possibilities of forming a continuing association of persons working in these fields. Since the advancement of science is best served through the sustained exchange of scientific results, and through just such continuing associations of scientists, perhaps no more encouraging and rewarding comment than this could be made upon the Philadelphia meetings in anthropology.

MARIAN W. SMITH, *Secretary*

Section on the Social and Economic Sciences (K)

The Section K program this year was developed as a series of joint meetings involving an examination of a number of current problems with representatives of other scientific groups. At a joint session with the National Academy of Economics and Political Science in collaboration with Pi Gamma Mu, Marion Folsom, chairman of the Board, Committee for Economic Development, outlined problems and prospects under the current program of economic mobilization and raised questions of balance between the civilian and the military effort and the efforts which would need to be taken to provide the desired output without incurring inflation. In the discussion, particular emphasis was placed on the question of whether the current effort can be considered as temporary or whether the country faces a long period of rearmament. A joint session with Section M carried further the discussions of social physics, which had been a feature of the 1950 meeting. A session on research needs and opportunities and developmental programs considered especially agricultural development in the Near East and in Latin America and also reported on the results of studies of noneconomic barriers to economic development, with particular reference to the Far East. This program, dealing with agricultural development in areas of population pressure, was closely related to the symposium on foods and people which was held later. The problems of scientific manpower, from the standpoint of supply and demand, training, and placement were discussed in joint sessions with the Conference on Scientific Manpower.

The section also cooperated with Alpha Epsilon Delta in a program on premedical education and social health and with the Society for Social Responsibility in Science in a panel discussion on the individual responsibility of the scientist. A program jointly arranged with the American Home Economics Association dealt with family life and home economics, summarizing trends and problems in marriage counseling, and some of the more recent research on child development.

H. R. Tolley was nominated as chairman of the section and Arthur E. Burns was elected to the 4-year term on the Section Committee.

CONRAD TAEUBER, *Secretary*

The National Academy of Economics and Political Science (K3)

The general subject of the Philadelphia session of the National Academy of Economics and Political Science was "Economic Mobilization: Problems and Prospects." The academy met jointly with Section K of the AAAS and with the collaboration of the National Social Science Honor Society—Pi Gamma Mu.

Program participants included W. Leon Godshall, of Lehigh University, presiding officer; Marion B. Folsom, chairman of the Board, Committee for Economic Development, and treasurer, Eastman Kodak Company, principal speaker; and Ewan Clague, commissioner of the Bureau of Labor Statistics, C. Jared Ingersoll, director of the Pennsylvania Railroad, and Charles R. Whittlesey, of the University of Pennsylvania, as members of the panel.

The important points developed at the session included a suggested reorientation of the government system of price and wage controls to that of a flexible system based on cost factors, with the gradual elimination of the system, and a new savings bond to yield a higher rate of interest for the purpose of stimulating savings and aiding in financing the mobilization program.

The thirtieth annual sessions of the academy will be held in Washington, D. C., in the late spring of this year. The topic for development will be announced in the Spring issue of the quarterly journal of the National Academy, *Social Science*, and in SCIENCE; complete programs will be forwarded to all members of the academy.

DONALD P. RAY, *Secretary*

Pi Gamma Mu (K5)

The annual Pi Gamma Mu luncheon in honor of officers of the National Academy of Economics and Political Science, and of the social science section of the AAAS, and speakers on their programs, was held on December 27. S. Howard Patterson, professor of economics in the University of Pennsylvania, president emeritus of the honor society, presided at the luncheon session, presenting citations and special Pi Gamma Mu honor keys to the special guests: Harold E. Stassen, president of the University of Pennsylvania, and Detlev W. Bronk, president of the Johns Hopkins University and new president of the American Association for the Advancement of Science. Both guests responded with brief addresses and appropriate expressions of appreciation for the honors bestowed upon them by the host society.

Immediately following the luncheon session, the Board of Trustees of Pi Gamma Mu convened in the same hotel for its annual meeting. Important items of business consisted of final verification of amendments to the charter and constitution of Pi Gamma Mu, whereby its affairs will be administered by seven trustees instead of five. Five trustees will be elected by the national convention and two trustees-at-large will be chosen by the Board of Trustees.

For the first time in the history of the society, a student advisor was present and participated in the annual meeting. Lucille Lopez Santos, of Our Lady of the Lake College, San Antonio, Texas, was elected by the eleventh biennial convention in June 1951 to this newly created office.

The trustees resolved in this meeting that the national life membership fee of Pi Gamma Mu should be increased from $7.00 to $10.00, effective September 1, 1952. This

is the second time since the founding of Pi Gamma Mu in 1924 that the membership fee has been increased, the last time being in 1940.

EFFIE B. URQUHART, *Secretary*

Philosophy of Science Association (L3)

The purpose of the two association meetings in the morning and the afternoon of December 29 was to discuss the concept of value as it appears in the various sciences and in philosophy. The aim was to discover whether there is a common agreement of meaning on the concept of value in the different disciplines, or whether, if differences do occur, the sciences could look forward to formulating a coherent concept through disciplinary approach.

In the morning sessions the concept of value was treated by Malcolm G. Preston, of the University of Pennsylvania, with respect to experimental work on some psychological determinations of value. The concept of value was also discussed with respect to some new developments in market research by Wroe Alderson, of Alderson & Sessions.

In the afternoon session Abraham Edel, of City College of New York, discussed the notion of value as it appears in the various philosophical theories of value. He contrasted the pragmatic and positivistic approaches and argued for the possibility of a coherent theory of value. Sebastian B. Littauer, of Columbia University, discussed the concept of value as it appears in modern industrial quality control. He argued that value is essentially implicit in the notion of quality.

Though the meetings did not come to any conclusion concerning a notion of a coordinated definition of "value," it was apparent that there is an excellent opportunity for an interdisciplinary approach.

C. WEST CHURCHMAN, *Secretary-Treasurer*

Section on Engineering (M)

The activities of Section M during the past year included: (1) the development of the program for the annual meeting; (2) participation in the program development of the Centennial of Engineering, to be held in Chicago in September 1952; and (3) preliminary plans for the St. Louis meeting for December 1952. We have continued our effort to obtain the cooperation of the various affiliated societies and are receiving excellent cooperation from the American Society of Mechanical Engineers. In the midst of these activities and plans the section suffered a serious loss in the sudden death of its chairman, B. A. Bakhmeteff.

The secretary of the section, F. D. Carvin, was appointed AAAS representative to the Coordinating Committee of the Centennial of Engineering 1952 and has been attending the monthly meetings of the committee in Chicago. We plan to hold one meeting of the section on September 2, 1952, at the Centennial in Chicago and to make our St. Louis meeting in December the closing engineering meeting of the Centennial.

At the annual meeting in Philadelphia, the section conducted 15 sessions and presented 42 papers on a wide variety of subjects. The meetings in general were poorly attended. Your committee is quite discouraged by the lack of interest shown by engineers in the annual meeting.

The Secretary of Section M extends the thanks of the section to the following individuals and organizations for their cooperation in developing the program for the annual meeting: G. Edward Pendray, New York, Social Physics Group; B. B. Day, American Society for Quality Control; O. B. Schier, III, American Society for Mechanical Engineers; Eugene K. Murphy, Veterans Administration; H. B. Allen, Franklin Institute; I. P. Orens, Newark College of Engineering; L. N. Gulick, Engineering College, University of Pennsylvania; J. S. Morehouse, Villanova College; R. C. Disque, Drexel Institute of Technology; W. E. Reaser, Swarthmore College; and R. M. Hogan, Engineering Manpower Commission.

The annual meeting of the Executive Committee of Section M was held Wednesday, December 26. Those present were C. E. Davies (chairman-elect), B. B. Day, and F. D. Carvin. The meeting confirmed the following officers and Executive Committee members for 1952: *vice president and chairman*, Clarence E. Davies, ASME, New York; *retiring chairman*, B. A. Bakhmeteff (deceased); *secretary*, Frank D. Carvin (1952), Illinois Institute of Technology, Chicago; *Executive Committee*: Irving P. Orens (1952), Newark College of Engineering; G. Edward Pendray (1953), New York; Henry B. Allen; Larry Chandler (1955), American Society of Civil Engineers, New York.

The section extends greetings to our new affiliate, the American Society for Quality Control.

The general topic for the annual meeting to be held in St. Louis in December 1952 will be "The Contribution of Science and Mathematics to Engineering and Industry." The AAAS plans to honor engineering at the annual meeting in recognition of the Centennial of Engineering 1952. All affiliated societies are invited to take an active part in planning our program for this meeting.

F. D. CARVIN, *Secretary*

Subsection on Medicine (N1)

The program of the subsection on medicine was devoted to a four-session symposium of 19 papers on various aspects of arteriosclerosis and the aging process, organized with the cooperation of the American Geriatrics Society, the Society for the Study of Arteriosclerosis, and the Gerontological Society. David Barr, of Cornell University Medical College, who was appointed vice president of the Association and chairman of Section N, replacing the late Malcolm Soule, introduced the symposium with a discussion of the distribution of cholesterol and phospholipids in free and bound form in various clinical conditions. Other speakers discussed the role of dietary and endogenous cholesterol, of arterial pressure, and of subendothelial hemorrhage in the genesis of atherosclerosis; the relative value of total as opposed to protein-bound cholesterol levels for discrimination between normal and arteriosclerotic groups; and cardiovascular function as modified by arterial disease, obesity, and senescence. Attendance at the sessions varied between 150 and 250.

A summary of the program, prepared by Harry E. Ungerleider, will be published in an early issue of *Geriatrics*.

G. K. MOE, *Secretary*

Subsection on Dentistry (N2)

The subsection on dentistry held three successful and profitable sessions on December 28 and 29. The Friday afternoon session, with James H. Shaw presiding, was devoted to a discussion of "Fluoridation as a Public Health Measure." At the Saturday meetings consideration was given to the use of radioisotopes in dental re-

search and recent developments in the study of tooth structure. Audiences ranging from 60 to 80 heard and discussed the 15 papers presented on the programs.

RUSSELL W. BUNTING, *Secretary*

Subsection on Pharmacy (N3)

The subsection on pharmacy held six sessions during the Philadelphia meeting. All six were joint meetings of the subsection, the American Pharmaceutical Association Scientific Section, and the American Society of Hospital Pharmacists. Twenty-five papers reporting original research were presented, and two panel discussions were held.

H. S. Bailey, Jr., and J. E. Christian, Purdue University, School of Pharmacy, described a procedure for the synthesis of urethan with N^{15} in the amide group. A. R. Biamonte and G. H. Schneller, Calco Chemical Division, American Cyanamid Company, gave details of experimental and analytical procedures in a study of the solubility of triple sulfonamide mixtures at different pH ranges and in the presence of suitable buffers. M. J. Rodman, Rutgers University, College of Pharmacy, evaluated the anhidrotic action of atropine on human thermoregulatory sweating.

E. V. Svedres and G. L. Jenkins, Purdue University, School of Pharmacy, reported on the synthesis of three new types of derivatives of the fluorene nucleus—2-aminofluorene, 2,7-diaminofluorene, and 2,2′-diamino-9,9′-spirobifluorene. T. J. Macek, Research and Development Division, Merck & Co., Inc., told of studies on crystalline vitamin B_{12} with reference to stability and formulation of pharmaceutical preparations. V. E. Tyler, Jr., and A. E. Schwarting, University of Connecticut, College of Pharmacy, showed that paper partition chromatography is of value in the separation of pairs of interconvertible isomerides among the ergot alkaloids.

J. R. Stockton and R. Zuckerman, Sharp & Dohme, Inc., studied a potentiometric method of assay for sodium *p*-aminosalicylate (sodium PAS) and found that an aqueous solution of the compound dissolved in propylene glycol and isopropyl alcohol treated with a solution of perchloric acid in the same solvents caused measurable increments in the pH changes. D. A. Schlichting and G. L. Jenkins, Research Laboratories, Wm. S. Merrell Co., reported on the synthesis of a lactone related to the cardiac aglycons. S. Scheindlin, A. Lee, and I. Griffith, Philadelphia College of Pharmacy and Science, established that riboflavin markedly intensifies the action of light on folic acid through oxidative cleavage.

M. Burke, T. L. Flanagan, R. L. Young, S. D. Bailey, and A. E. Heming, Research Division, Smith, Kline & French Laboratories, presented a new sensitive assay for khellin in serum based on its polarographic reduction. J. W. E. Harrison, C. M. Ambrus, and J. L. Ambrus, Philadelphia College of Pharmacy and Science, studied the habituation, tolerance, and dependence on the drugs amphetamine and desoxyephedrine in rats.

J. L. Ambrus, C. M. Ambrus, J. W. E. Harrison, C. E. Moser, and C. E. Leonard, Philadelphia College of Pharmacy and Science, showed that the effect of hypnotic, as well as general anesthetic, drugs is increased by the concomitant administration of antihistamine drugs. L. Gershenfeld and B. Witlin, Philadelphia College of Pharmacy and Science, investigated iodine solution as a sporocidal agent. R. J. Ferlauto, E. J. Fellows, S. D. Bailey, W. C. Ellenbogen, and A. Heming, Smith, Kline & French Laboratories, reported on Neo-penil, a new antibiotic compound, which is the diethylaminoethyl ester of penicillin G. B. M. Sutton and J. B. Data, Purdue University, School of Pharmacy, reported on a series of 2-amino derivatives of certain alkoxy alkanes. A. J. McBay, Massachusetts College of Pharmacy, reported on simplified pH approximations. P. G. Shaw and R. Bogash, Memorial Hospital, Wilmington, Del., reported work with sodium cellulose sulfate as a new medium for the suspension of barium sulfate. Fine dispersion and thorough suspension of the barium gives greater range of roentgenologic opacity, finer detail, and clearer differentiation of certain tissues. A. Purdum, Johns Hopkins University Hospital, acted as group leader and moderator in a panel discussion of specific research studies needed in hospital pharmacy. T. A. Manzelli and H. L. Flack described the preparation of a mixed bed deionizer for the hospital pharmacist.

B. E. Conley, of the American Medical Association Laboratories, was moderator of a panel discussion on the subject "Newer Toxicants of Medical, Economic and Pharmaceutical Interest." A. J. Lehman, Pharmacology Division, Food and Drug Administration, presented the pharmacological viewpoint, E. E. Fleck, Bureau of Entomology and Plant Quarantine, presented the chemical viewpoint, F. F. Heyroth, Kettering Institute for Applied Physiology, presented the pathological viewpoint, and R. Blackwell Smith, Pharmacy School, Medical College of Virginia, gave the medical-pharmaceutical viewpoint. K. P. DuBois, Toxicity Laboratory, University of Chicago, gave the chemistry and therapeutic applications of organo-phosphorus compounds.

GLENN L. JENKINS, *Secretary*

Section on Agriculture (O)

The section presented a two-day program and cooperated with Sections C and G in sponsoring a program that filled a third day. The papers presented during the first two days dealt with the interrelationship of soil and plant and animal nutrition. Some valuable summations of our knowledge concerning soil deficiencies of both major and micronutrients were presented. The roles of these elements in plant nutrition were discussed, and the effects of deficiencies on the nutrition of both plants and animals were brought out. The concentration of selenium in some plants and its toxicity to animals were also considered. Papers dealing with human nutrition appeared to be of especial interest to the audience.

During the third day's program results of research with a new material prepared by the Monsanto Chemical Company for the improvement of the mechanical condition of soils were presented. The papers elicited much discussion.

All programs were well attended, and a somewhat larger room would have been a convenience.

C. E. MILLAR, *Secretary*

Section on Industrial Science (P)

On July 1, 1951, the Executive Committee of the AAAS officially formed the Section on Industrial Science, pursuant to a vote of the Council, and a nucleus of the Section Committee was appointed. The objectives and scope of the section were developed as follows: (1) to advance the knowledge and application of science to industry; (2) to further the interests and status of scientists engaged in research, education, or other work having to do with the development, application, and use of scientific principles and knowledge to problems of industrial operation and management; and (3) to promote public un-

derstanding and appreciation of the importance and promise of industrial science in human progress and welfare.

At Philadelphia the new Section on Industrial Science held its first formal meeting. On Friday, December 28, Detlev W. Bronk officially installed the section and gave it the blessing of the AAAS. Following the installation, Edward R. Weidlein, president of the Mellon Institute, presented the keynote address, the theme being "Bridging the Gap." Dr. Weidlein discussed the coordination of the philosophies of those engaged in pure research and those engaged in applied or industrial research.

The program for Saturday morning was concerned with "Industrial Science Today." Presiding was H. Thomas Hallowell, Jr., president of Standard Pressed Steel Corporation. The speakers included Robert E. Wilson, chairman of the board, Standard Oil Company (Ind.), who discussed the petroleum industry; Hiland G. Batcheller, chairman of the board, Allegheny Ludlum Steel Corporation, who discussed the steel industry; J. B. Fisk, director of research, Bell Telephone Laboratories, the communications industry; Norman A. Shepard, chemical director, American Cyanamid Company, the chemical industry; and E. H. Volwiler, president of Abbott Laboratories, the pharmaceutical industry.

On Saturday afternoon, a panel presented various aspects of "Industrial Science Tomorrow" from the viewpoints of the consultant, the educator, the research institute, and the government. The speakers included Lillian M. Gilbreth, president, Gilbreth, Inc.; James Creese, president, Drexel Institute of Technology; Frank C. Croxton, assistant director, Battelle Memorial Institute; and Alan T. Waterman, director of the National Science Foundation. John S. Zinsser, chairman of the board, Sharp & Dohme, Inc., presided.

The final session on Sunday morning was concerned with "Public Aspects of Industrial Science," with Edward Hopkinson, Jr., of Drexel & Company, presiding. The subjects were broad and included: "The Contributions of Industry to Scientific Education," C. L. Emerson, vice president, Georgia Institute of Technology; "Industrial Science and Community Health," Charles L. Dunham, chief, Medical Branch, Division of Biology and Medicine, U. S. Atomic Energy Commission; "The New Industry and the Community," Robert A. Neary, chief, Plant-Town Community Relations Section, Public Relations Department, Aluminum Company of America; and "Industrial Science and Community Relations," G. Edward Pendray, president, Pendray & Company.

The general policy of the AAAS, as set forth in the Arden House Statement and the remarks made by Kirtley F. Mather at the Secretaries' Luncheon, cannot be overemphasized as they concern the future of Section P. In fact, these policies and philosophies would appear to establish a foundation from which Section P will be able to take strength and grow, for they point toward a departure from the state of isolation of individual sections and toward coordination of effort among the several sections. Section P should admirably serve as a common meeting ground for the application of principles that come from not only the sections having to do with the physical sciences but also those concerned with the social sciences.

N. V. HENDRICKS, *Secretary*

The American Industrial Hygiene Association (P1)

The American Industrial Hygiene Association held its first interim meeting with Section P of the AAAS on December 28. Approximately 5% of the membership was present. The annual meeting of the association will be held in Cincinnati, April 22–24, 1952, at which time newly elected officers will be installed. Tentatively it is planned to arrange an interim meeting with the AAAS in St. Louis in 1952.

HENRY F. SMYTH, JR., *Executive Secretary*

Society for Industrial Microbiology (P2)

The Society for Industrial Microbiology held its meetings under the auspices of the newly inaugurated Section P of the AAAS. A program of contributed papers was presented at the first session on December 27. The remainder of the formal program was devoted to symposia dealing with the general topic of "Microbiologic Assay." President Duggar introduced these symposia with an excellent historical review of the utilization of microorganisms in various types of assays. Topics discussed included fungi in the discovery of essential elements, microbiological determination of vitamins, amino acids, laboratory evaluation of antibiotics, testing agricultural fungicides, and tests in military specifications in deterioration prevention. As an index to the interest in these topics, the ballroom of the Sylvania Hotel, where the program was held, was taxed to its capacity.

Friday, December 28, was devoted to guided tours to Frankford Arsenal, Philadelphia Quartermaster Depot, Eastern Regional Laboratory of the Department of Agriculture, Rohm & Haas Co., and Smith, Kline & French Laboratories. These tours were well attended.

The secretary announced the newly elected officers for 1952: *president*—Benjamin M. Duggar, Lederle Laboratories; *vice president*—Kenneth Raper, mycologist, Northern Regional Research Laboratories; *director*—Walter N. Ezekiel, Navy Bureau of Ordnance. Continuing officers are the *secretary*, C. L. Porter, Purdue University, and two *directors*—Alden B. Hatch and John S. Karling.

C. L. PORTER, *Secretary*

Section on Education (Q)

The program of Section Q was unusually successful this year. Only one author was unable to be present, and the papers were of uniformly high quality. The attendance, too, was higher than at any other recent meeting. The average was more than 50, and in some instances more than 100 persons were attracted to a program.

The customary joint session was held with Section I, Psychology, and both of the vice-presidential addresses attracted a great deal of comment. The symposium on visual problems in industry was a continuation of the one held a year ago and was attended primarily by those engaged in training programs in industry. A two-session symposium on the teaching of science, arranged by S. R. Powers, vice president of the section, was one of the features of the program, and a third session was given over to reports of research studies in that area. A series of papers presented factual evidence concerning pupils' school achievement at present as compared with earlier times. In only a few instances does it appear that the product of the schools is less efficient than formerly. In some cases no differences were reported. In most studies a difference was found in favor of the present, and there is much that was not given in the curriculum at all in earlier years. It was emphatically recognized, however, that the schools are far from their goals.

As the Association's symposium "Operation Knowl-

edge'' was a direct continuation of a symposium of Section Q at the Cleveland meeting and was in this instance originated and promoted by Section Q, it should be mentioned here as a part of our report. The papers on this symposium represented a very wide range of interest and experience and reached an extremely high standard in both content and style. The attendance at each of the three sessions ran over a hundred.

D. A. WORCESTER, *Secretary*

National Science Teachers Association (Q2)

Judging by reports of those in attendance, the 1951 meeting of NSTA with the other science teaching societies of the AAAS was ''the best yet'' in the four-year-old series of joint meetings. Attendance was excellent, and the general nature of the individual NSTA sessions appealed strongly to classroom teachers.

Space limitations prevent mention of all the excellent contributions of the 30 or more NSTA program participants. However, the classroom demonstrations and ''how-to-do-it's'' presented by Hubert Alyea, Princeton University; Paul Brandwein, Forest Hills (N. Y.) High School; Richard Sutton, Haverford College; Elbert Weaver, Phillips Academy, Andover, Mass.; Dwight Sollberger, Indiana (Pa.) State Teachers College; and Rolland Gladieux, Kenmore (N. Y.) High School, stood out in the opinion of the attendants.

A notable and highly successful session the first afternoon of the conference was entirely devoted to the teaching of science in the elementary school. Glenn Blough, of the U. S. Office of Education, conducted a demonstration lesson with a fourth-grade group of youngsters from the Philadelphia schools, and a panel of discussants went on to consider such problems as materials for instruction, techniques and methods, integration, and evaluation.

Another innovation was a session devoted to health science and health education. Reports of actual practices in Oak Park, Ill., Atlanta, Ga., and Euclid, Ohio, served to set the stage for discussion by the group assembled and a representative of the American Association for Health, Physical Education, and Recreation.

''Tomorrow's Scientists and Engineers—Today's High School Youth'' provided statistics and needs relative to scientific manpower, and in this connection the NSTA cooperative program with the Edison Foundation in holding Institutes for Science Teachers was reviewed. At this session, Walter Morrison, of the American Society for Metals, presented NSTA with a check for $10,000 to underwrite a program of awards to science students, science departments, and science teachers. The program will be announced and launched this spring in all the high schools of the United States and Canada.

Arthur O. Baker, president of NSTA; Harold E. Wise, University of Nebraska, president-elect; and Robert H. Carleton, executive secretary, represented the association at the preliminary planning session for the 1952 meeting of the AAAS science teaching societies. It is anticipated that the societies will again meet with AAAS in St. Louis next December. Meanwhile, the next meeting of NSTA will be held June 26–28 at the University of Michigan.

ROBERT H. CARLETON, *Executive Secretary*

Conference on Scientific Manpower (X6)

At Philadelphia, a ''Conference on Scientific Manpower'' was, for the first time, a part of the Association's program. The objective of this conference was the consideration of the vital problems involving scientific and technical manpower in all scientific fields, and its cosponsors were the AAAS Cooperative Committee on the Teaching of Science and Mathematics, Section I, Section K, Section M, Engineers' Club of Philadelphia, and the Engineers' Council for Professional Development. The program committee for this three-day conference consisted of Ralph M. Hogan, Manpower Branch, Human Resources Division, ONR (chairman); T. A. Marshall, Engineering Manpower Commission, Engineers' Joint Council; M. H. Trytten, Office of Scientific Personnel, NRC; and John A. Nagay, Manpower Branch, Human Resources Division, ONR (secretary).

Dr. Trytten presided at the session on ''Supply and Demand for Scientific Personnel.'' David Rodnick, of the Economic Cooperation Administration, spoke on ''Scientific Manpower behind the Iron Curtain,'' describing interesting and little-known differences in Soviet policies and those of the democracies regarding selection, training, and utilization of technical personnel. The policies governing the National Science Foundation program in granting fellowships for graduate study and in awarding grants for aid in basic research were outlined by Harry C. Kelly, who invited suggestions from scientists during the present period, while policies of the foundation are being formulated. A paper by J. F. Hilliard, of the Defense Manpower Administration, U. S. Department of Labor, emphasized the growing shortage of scientific and engineering manpower—represented by about 0.4% of the population of this nation. He spoke of the wisdom of encouraging democracy's growth in other nations through political and technological means, in order that the principles of democracy may be welded to our international enterprises and thus used as a major instrument of national policy. The question of supply and demand for social scientists was discussed by Elbridge Sibley, of the Social Science Research Council, who attributed the inexactness of data concerning this supply and demand to the meager support of research and training of professionally qualified research workers in these fields. Dr. Sibley offered the fact that memberships in the professional societies in social science fields provide a poor index of the total number of those who are professionally competent, since these societies lack strict requirements for entrance and membership. There is no unemployment in these fields; however, the demand in academic institutions is greatly reduced at present, whereas that of government is increased.

The session on post-baccalaureate training was presided over by George B. Thom, of the Newark College of Engineering. Guy Kleis, Westinghouse Electric Corporation, spoke on ''In-service Training of Engineers and Scientists in Industry.'' Successful programs include work assignments and classroom instruction. The practice is not new in the large industries and is being adopted rapidly in the smaller ones. The same type of in-service training was discussed by W. G. Torpey, personnel officer of the Naval Research Laboratory, who outlined efforts made by government agencies to upgrade young workers through additional training, thereby increasing the quality of engineering and scientific personnel, now such a limiting factor in expanding research and developmental activities. The summer employment opportunities available in many government laboratories are especially valuable to junior physicists. The in-service training programs are similar in many respects to those of industry, but there appears to be a tendency in government-sponsored activity to lean toward near-by universities for off-campus

extension courses, which are often patterned for the needs of the particular laboratory sponsoring the training. Seminars and colloquia are common and advantageous in the government laboratories. The final paper of the session was that of Herbert E. Longenecker, dean of the Graduate School, University of Pittsburgh: "The Unique Contribution of the Graduate School in the Development of Human Resources." He presented the theory that national security faces a problem in human resources, the solution of which lies in further education in the graduate school. The alarmingly reduced enrollment in graduate schools might be countered by increased support from government and industry. The steady extension of graduate study programs to off-campus locations is a significant trend in education. Dr. Longenecker cited the lack of attention currently devoted to nontechnical fields in many graduate schools, and he deplored the tendency of college graduates to seek graduate work despite the fact that they possess the barest minimum of requirements for graduation at the bachelor level. Marsh W. White, Pennsylvania State College, summarized the papers of this session.

The final session of the conference, presided over by Dael Wolfle, was devoted to "Selection Techniques: Psychological Background." Henry Chauncey, president of the Educational Testing Service, released for the first time data concerning the results of the Selective Service College Qualification Test. These results were not only significant but, in some instances, startling. Important differences in test performance were noted in geographical regions; the Middle Atlantic states ranked highest and the Southern states lowest. In the major fields of study, engineering and physical sciences ranked highest, followed in rank by biological sciences, social sciences, humanities, arts, commerce, agriculture, and education. Of great interest and importance was the variability found among various colleges and universities, some institutions passing nearly 100% of students and others passing as few as 35%. Technical schools ranked consistently higher than the arts colleges. The original expectation that such tests, with rank in class, would serve effectively in qualifying capable students for deferment is confirmed by the findings. "The Effectiveness of a Selective Program for Scientists" was prepared by C. J. Lapp, Office of Scientific Personnel, NRC, who emphasized the benefits to society as a whole from fellowships. There have been 1,000 fellowships granted through the National Research Council, and although these were largely supported through private funds, the present tendency is toward government grants, with a much larger number available. Techniques of selection of fellows are necessarily different in the granting of government funds. These differences are due in part to pertinent government regulations, which were discussed by Dr. Lapp. John C. Flanagan, director of the American Institute for Research at the University of Pittsburgh, presented the final paper of the symposium: "Measuring Research Effectiveness." Critical requirements for typical research jobs have been established, and tests based on those techniques are now in process of validation. Summarizer for this session was C. W. Hawley, National Security Resources Board.

It is most gratifying to those concerned with human resources in scientific and technical fields that conferences on this subject are to be a permanent feature of the AAAS annual program. Enthusiasm and singleness of thought and purpose were apparent in the group attending the conference. Questions were invited and encouraged after presentation of each paper, and they demonstrated the wisdom of gathering together those persons aware of the problems in scientific manpower in this country. All the papers presented at the conference are being printed in book form and will be available within the next two or three months from the Manpower Branch, Office of Naval Research, Department of the Navy, Washington, D. C.

MARSH W. WHITE
VIRGINIA M. BOLTON

Sigma Delta Epsilon (X13)

Sigma Delta Epsilon, Graduate Women's Scientific Fraternity, held its national convention December 27–29 in Philadelphia. This organization was founded in 1921 at Cornell University, and 1951 marked its thirtieth year.

The recipients of two research awards, given to members for research published in a scientific journal or presented at a scientific meeting, were announced. Margaret Green, of Ohio State University, was awarded $500 for her paper on "Further Morphological Effects of the Short Ear Gene in the House Mouse." Two hundred dollars was given to Marie Farnsworth, of New York City, for her paper on "Ancient Pigments, Particularly Second Century B.C. Pigments from Corinth."

At the Grand Chapter meeting officers elected for 1952 were: *president*, Elizabeth Mackay, Department of Biological Sciences, Purdue University; *vice presidents*, Mildred Engelbrecht, Department of Bacteriology, University of Alabama, Mary Keeffe, Department of Biology, College of St. Thomas, St. Paul, Minn.; *secretary*, Hellen Linkswiler, Laboratory of Human Nutrition, University of Alabama; *treasurer*, Mrs. Richard Lewis, Royal Oak, Mich.

The speaker for the luncheon for all women in science was Edith Quimby, along with Katherine B. Blodgett, a new national honorary member. Dr. Quimby spoke on "Dating of Archaeology and Paleontology by Radioactive Isotopes."

FRANCES L. NAYLOR, *Secretary*

A.H.T. CO. SPECIFICATION

MICRO SLIDES

NON-CORROSIVE, RED LABEL

7030.

Including Glazed Edge Slides, discontinued in 1945 but now again available. A low priced Slide for routine and student use.

7036-A.

MICRO SLIDES, Non-Corrosive, Red Label, A.H.T. Co. Specification. Of the best hard glass available, of high resistance to attack by moisture, and guaranteed against corrosion in any climate. Thickness varies between 1.10 and 1.30 mm.

The glass from which our Slides are made is of superior quality, particularly as to surface finish and uniform thickness, so that the three grades are identical as to stability, optical quality and planeness of surface, the following classification depending upon freedom from bubbles, pits, nicks and striae and in the finish of the edges:

Special Slides. With polished edges, slightly beveled on the 3-inch edge, and with rounded corners. Entirely free from bubbles, pits, nicks and striae. Individually selected and *cleaned* and, in our judgment, *the best micro slide now available.*

Clinical Slides. With ground edges and rounded corners, but without bevel on the 3-inch edge. Made from the same glass as Special slides but with selection based upon the plate from which the slides are cut rather than upon the individual slide. Offered as *a superior slide for general work.*

Glazed Edge Slides. Identical with Clinical Slides except as to finish of the edges and corners. Manufactured by a process which eliminates the edge grinding and consequent washing and drying, and results in *a low priced slide suitable for routine and student use.*

7030. Micro Slides, Non-Corrosive, Red Label, Special, size 3×1 inches, as above described; packed in carton containing ½ gross. **Per gross** **2.15**

7030-B. Ditto, Clinical. Per gross **1.70**

7030-C. Ditto, Glazed Edge. Per gross **1.15**

7036-A. Micro Slides, Non-Corrosive, Red Label, Special, size 3×1 inches, identical with 7030 but with 18 mm surface at one end etched evenly on *both* sides for marking. This etched surface has a superior velvet matte finish which takes lead pencil, hard wax pencil, India ink, "Labink" or similar preparations, and ordinary writing ink much better than the usual ground surface. **Per gross** **3.00**

7036-B. Ditto, Clinical. Per gross **2.60**

10% discount in case containing 25 gross, one catalogue number only
20% discount in lots of 100 gross } *7030 to 7036-B, incl., singly or assorted in case units*
25% " " " " 500 " }

ARTHUR H. THOMAS COMPANY
LABORATORY APPARATUS AND REAGENTS
WEST WASHINGTON SQUARE
PHILADELPHIA 5, PA.
Teletype Services: Western Union WUX and Bell System PH-72

Publications Received

L'Astrologie. Collection "Que Sais-je?" No. 508. Paul Coudere. Paris: Presses Universitaires de France, 1951. 127 pp. Illus..

Cement and Concrete Reference Book. Chicago: Portland Cement Association, 1951. 111 pp. Illus.

Contributions to the Flora of South America. Studies on Andean Compositae*—II; Studies in *South American Plants*—III. Fieldiana: *Botany, Vol. 27, No. 2. José Cuatrecasas. Chicago: Chicago Natural History Museum, Nov. 1951. 113 pp. Illus. $1.50.

The Early Literature on Mallophaga 1763–1775, Vol. 2, No. 1. Theresa Clay and G. H. E. Hopkins. London: British Museum (Natural History), 1951. Pp. 1–36, 3 plates. 10s.

Engineers' Council for Professional Development. Nineteenth Annual Report, 1950–1951. New York: ECPD, 1951. 58 pp. 50¢.

Introductions to Scientific Works in Humanities & Social Sciences. Japan: Higher Education and Science Bureau, Ministry of Education, 1951. 223 pp.

Inventories of Apparatus and Materials for Teaching Science. Vol. III, Pt. 3, ***Agricultural Sciences.*** Paris: Unesco, 1952. (U. S. distrib.: Columbia University Press, 2960 Broadway, New York 27.) 139 pp. $2.50, 14/–, or 700 fr.

Laboratory Exercises in Genetics. Howard A. Royle. Minneapolis, Minn.: Burgess, 1950, 1951. 53 pp. $1.50.

List of Parasites of Domesticated Animals in North America. Rev. 2nd ed. Edward A. Benbrook. Minneapolis: Burgess, 1952. 63 pp. $1.75.

Magic Oil: Servant of the World. Alfred M. Leeston. Dallas, Texas: Juan Pablos Books, 1951. 237 pp. $3.75.

Memorial Center for Cancer and Allied Diseases, Quadrennial Report. New York: Memorial Center for Cancer and Allied Diseases, 1951. 177 pp.

Nicknames of American Cities, Towns, and Villages, Past and Present. Gerald L. Alexander. New York: Special Libraries Association, 1951. 74 pp. $2.00.

Observations on the General Effects of Injury in Man with Special Reference to Wound Shock. Medical Research Council Special Report Series No. 277. R. T. Grant and E. B. Reeve. London: H. M. Stationery Off., July 1951. 313 pp. 8s 6d.

Petroleum Desulfurization, An Annotated Bibliography. Bull. No. 4. Henry Rakoff. Laramie: University of Wyoming Natural Resources Research Institute, June 1951. 176 pp.

Physicians Federal Income Tax Guide. Hugh J. Campbell and James B. Liberman. Great Neck, N. Y.: Doniger & Raughley, 1952. 112 pp. $2.50.

A Pictorial History of Northwestern University, 1851–1951. Evanston and Chicago, Ill.: Northwestern Univ. Press, in cooperation with 1951 *Syllabus,* 1951.

The Political Theory of the Old and Middle Stoa. Margaret E. Reesor. Locust Valley, N. Y.: J. J. Augustin, 1952. 60 pp. $1.50.

Proceedings of the First Conference on Cancer Diagnostic Tests. Sponsored by the National Advisory Cancer Council in Chicago on Oct. 14, 1950. Public Health Service Pub. No. 96. Washington, D. C.: Federal Security Agency, 1951. v + 91 pp. 30¢.

Elias E. Ries, Inventor. Estelle H. Ries. New York: Philosophical Library, 1951. 369 pp. $4.75.

Turkey. T. G. A. Muntz. New York: Philosophical Library, 1951. 194 pp.

Meetings & Conferences

Feb. 26–27. Building Research Advisory Board, Correlation Conference on Condensation Control in Buildings. National Academy of Sciences, Washington, D. C.

Feb. 26–28. American Concrete Institute. Netherland Plaza Hotel, Cincinnati.

Feb. 27–29. American Association of Economic Entomologists, Southwestern Branch. Plaza Hotel, San Antonio.

Feb. 28–29. American Association of Petroleum Geologists, Rocky Mountain Section (Annual). Hotel Utah, Salt Lake City.

Feb. 28–Mar. 1. National Conference on Rural Health. Shirley-Savoy Hotel, Denver.

Feb. 29. Natural Gasoline Association of America. Lincoln Hotel, Odessa, Tex.

Feb. 29–Mar. 1. Alabama Academy of Science. Spring Hill.

Mar. 2–3. Western Society of Electroencephalography (Annual). Del Monte Lodge, Pebble Beach, Calif.

Mar. 3–5. National Cancer Conference. Netherland Plaza Hotel, Cincinnati.

Mar. 3–6. Institute of Radio Engineers. Waldorf-Astoria Hotel and Grand Central Palace, New York.

Mar. 3–7. American Society for Testing Materials (Spring). Cleveland.

Mar. 5–7. Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy. William Penn Hotel, Pittsburgh.

Mar. 6–7. National Aviation Education Council. Biltmore Hotel, Los Angeles.

Mar. 6–8. American Academy of Forensic Sciences (Annual). Atlantic Biltmore Hotel, Atlanta.

Mar. 6–8. International Mathematical Union. Rome.

Mar. 8–12. American Association of School Administrators (Regional). Los Angeles.

Mar. 10–13. National Electrical Manufacturers Association. Edgewater Beach Hotel, Chicago.

Mar. 10–13. New Orleans Graduate Medical Assembly (Annual). Municipal Auditorium, New Orleans.

Mar. 10–14. National Association of Corrosion Engineers (Annual). Galveston.

Mar. 13–14. National Health Council (Annual). Roosevelt Hotel, New York.

Mar. 16–19. American Institute of Chemical Engineers. Atlanta Biltmore Hotel, Atlanta.

Mar. 17–19. Midwestern Conference on Fluid Mechanics. Ohio State University, Columbus.

Mar. 17–21. American Society of Tool Engineers. Industrial Exposition. Chicago International Amphitheatre, Chicago.

Mar. 17–22. Pakistan Association for the Advancement of Science (Annual). Peshawar University, N.W.F.P.

Mar. 19–21. American Association of Anatomists (Annual). Brown University, Providence, R. I.

Mar. 20–22. American Physical Society. Deshler-Wallick Hotel, Columbus, Ohio.

Mar. 23–27. American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, Society of Exploration Geophysicists (Joint Annual). Biltmore Hotel, Los Angeles.

Mar. 24–27. American Chemical Society. Buffalo, N. Y.

Mar. 24–27. American Mosquito Control Association (Annual). Salt Lake City.

Mar. 27–28. American Association of Economic Entomologists, North Central States Branch. St. Paul Hotel, St. Paul, Minn.

PERSONNEL PLACEMENT

YOUR ad here reaches over 32,000 foremost scientists in the leading educational institutions, industrial laboratories, and research foundations in the U. S. and 76 foreign countries—at a very low cost

CLASSIFIED: 15¢ per word, minimum charge $3.00. Use of Box Number counts as 10 additional words.

DISPLAY: $17.50 per inch, no charge for Box Number.

Correct payment to SCIENCE must accompany all ads. Insertion usually made 2 or 3 weeks after receipt of ad.

SCIENCE • 1515 Mass. Ave., N.W., Wash. 5, D. C.

POSITIONS WANTED

Biochemical executive: 17 yrs. industrial chemical experience. Pharmaceutical, food, nutritional, protein, microbiological, fermentation, enzyme, and organic chemistry. Patents, processes, publications, public relations. Age 38. Ph.D. '42. Research Director. Box 95, SCIENCE. 2/29; 3/14

Biologist: B.S. (Biology); M.S. (Entomology) with additional work in entomology; 4 consecutive summers varied and responsible entomological field work in 3 different states; 1 yr. full time laboratory assistant 5 sections General Zoology; taught courses in entomology at a state university; age 29. Seeks Academic position. Box 97, SCIENCE. X

Position Wanted:
Pharmacologist; well qualified in physiology; Ph.D.; five years, associate professor pharmacology, university medical school; five years, chief, pharmacological research, well known foundation; for further information, please write Burneice Larson, Medical Bureau, Palmolive Building, Chicago. X

Pharmacologist, Ph.D. Experience in teaching and industrial research desires position in Medical School. Box 101, SCIENCE. 2/22; 29.

Scientist desires technical sales position. Well rounded microbiologist with better than M.S. equivalent; with biochemical interest. Good industrial research experience. Experience in food technology. Professional member of I.F.T. Good medical microbiological background from Naval service. Registered medical technologist. Box 98, SCIENCE. X

Statistician—Qualified physician holding mathematics degree will analyze data by mail, especially medical or biological (significant differences, ch-square, correlation, etc.). Box 99, SCIENCE. X

Medical Writer available in February. Brochures, pamphlets, catalogues, copywrite, editing, package inserts general writing. Ph.D. in Medical Sciences. Experienced. Box 100, SCIENCE. X

Zoologist, Ph.D., Assistant Professor, 4 years experience teaching zoology, biology, field zoology, ecology, physiology. Major interest ecology. Desires new academic or research position. Box 96, SCIENCE. X

POSITIONS OPEN

Fermentation Chemist

Experienced in antibiotics for development work. Salary commensurate with education and experience. Send complete background, education, experience and recent photograph in first letter. Location in Midwest, 25 miles from metropolitan Cincinnati.

SCHENLEY LABORATORIES, INC.
Lawrenceburg, Indiana
Att.: M. Rosenblatt

Teaching assistantships in Biology leading to Master's degree in two years. For further information apply to Director of Graduate Study, Northeastern University, Boston 15, Massachusetts. 2/8; 2/13

LOOK AROUND... notice the increasing number of satisfied advertisers using small-space ads regularly in practically every issue of SCIENCE—*proof that these small ads get results!* If you have a product or service of interest to scientists, why not take advantage of this low-cost means of increasing your profits!

POSITIONS OPEN

Microbiologist

Experienced in mycology and antibiotics research for expanding development program. Salary commensurate with education and experience. Send complete background, education, experience, and recent photograph in first letter. Location in Midwest, 25 miles from metropolitan Cincinnati.

SCHENLEY LABORATORIES, INC.
Lawrenceburg, Indiana
Att.: M. Rosenblatt

Positions Open:
(a) **Histopathologist**; preferably experienced in research on tumor pathology; research post; agricultural college; South; $8000. (b) **Chemist**; research involving diagnostic health examinations; diagnostic group; health resort town, South. (c) **Biochemist** or **Physical Chemist** to take charge of division, new research laboratory, large teaching hospital; Midwest. (d) **Pharmaceutical Chemist** or **Biochemist**; new product department; laboratories specializing in allergy products; West. (e) **Physiologist** or **Pharmacologist,** Ph.D.; duties: primarily research involving cardiovascular phenomena; one of leading pharmaceutical companies. (f) **Ph.D.** pharmacology or physiological chemistry with considerable experience in pharmacological field, to serve as technical service representative; large company; Midwest. (g) **Psychologist**; Ph.D., for psychological testing, capable of developing training program for psychology interns; private institution, university medical center; Midwest. (h) **Analytical Chemist** and Bacteriologist with virology training; research laboratories; Pacific Coast. S2-3 Science Division, Medical Bureau (Burneice Larson), Palmolive Building, Chicago. X

The MARKET PLACE

BOOKS • SERVICES • SUPPLIES • EQUIPMENT

YOUR ad here reaches over 32,000 foremost scientists in the leading educational institutions, industrial laboratories, and research foundations in the U. S. and 76 foreign countries—at a very low cost

CLASSIFIED: 20¢ per word, minimum charge $5.00. Use of Box Number counts as 10 additional words. Correct payment to SCIENCE must accompany ad.

DISPLAY: Rates listed below—no charge for Box Number. Monthly invoices will be sent on a charge account basis—providing satisfactory credit is established.

Single insertion	**$17.50 per inch**
7 times in 1 year	**16.00 per inch**
13 times in 1 year	**14.00 per inch**
26 times in 1 year	**12.50 per inch**
52 times in 1 year	**11.00 per inch**

For PROOFS on display ads, copy must reach SCIENCE 4 weeks before date of issue (Friday of every week).

LANGUAGES

Listen and Learn a Language by LINGUAPHONE

At home learn to speak Spanish, French, German, Russian, the Asiatic languages by quick easy Linguaphone World's-Standard **Conversational** Method. Over a million Home-study students. Save time, work, money. *Send for* **Free** *book* **Today.**

LINGUAPHONE INSTITUTE • 8402 Radio City, New York 20

BOOKS

WANTED TO PURCHASE . . .
SCIENTIFIC and BOOKS PERIODICALS
Sets and runs, foreign and domestic. Entire libraries and smaller collections wanted.

WALTER J. JOHNSON • 125 East 23rd St., New York 10, N. Y.

Your sets and files of scientific journals are needed by our library and institutional customers. Please send us lists and description of periodical files you are willing to sell at high market prices. Write Dept. AJS, J. S. CANNER, INC. Boston 19, Massachusetts

The MARKET PLACE

BOOKS • SERVICES • SUPPLIES • EQUIPMENT

BOOKS

SCIENTIFIC BOOKS and PERIODICALS WANTED
Complete libraries—Sets and runs—Single titles
Also, please send us your want lists.
STECHERT - HAFNER, INC.
31 East 10th St., New York 3

PROFESSIONAL SERVICES

FOOD RESEARCH LABORATORIES, INC.
Founded 1922
Philip B. Hawk, Ph.D., President
Bernard L. Oser, Ph.D., Director
Research • Analyses • Consultation
Biological, Nutritional, Toxicological Studies for the Food, Drug and Allied Industries
48-14 33rd Street, Long Island City 1, N.Y.
• RESEARCH
• CONSULTATION
• ANALYSES

LOOKING FOR A PUBLISHER?
Write for **Free Booklet SC** telling how we can publish your book. All subjects considered. New authors welcome.
VANTAGE PRESS, Inc. 230 W. 41 St., New York 18.

A NATIONAL SERVICE
ALBERT TEACHERS AGENCY and COLLEGE BUREAU

RELIABLE and PERSONAL SERVICE
. . . to Colleges and Universities of the Nation and their Personnel. Originated and continued by three generations of the Albert family.
Member N.A.T.A.
25 E. Jackson Blvd. Chicago 4, Illinois

ANNOUNCING
POST-GRADUATE INSTRUCTION IN HOMOEOPATHY
24th Session
POST-GRADUATE SCHOOL
American Foundation for Homoeopathy
Time: June 30 to August 8, 1952.
Place: Senexet House, Putnam, Connecticut.
Write to Foundation Secretary: Julia M. Green, M.D.
1726 Eye Street, N.W. Washington 6, D. C.

SUPPLIES AND EQUIPMENT

BASIC MANUFACTURERS
of analytically pure L-ISOLEUCINE, GLYCLYGLYCINE, L-PROLINE, HYDROXY-L-PROLINE, L-ARGININE · HCl and other AMINO ACIDS
PREMIXED MEDIA FOR MICROBIOLOGICAL ASSAY of AMINO ACIDS
Send for our catalogue
H. M. CHEMICAL COMPANY, LTD.
1651—18th St. Santa Monica, Calif.

FOR MICROSCOPY—SHILLABER'S IMMERSION OIL
Numerous advantages over Cedar Oil.
Used in many leading laboratories.
Type A (low viscosity)—preferred by many.
Type B—regular viscosity
COMBINATION PACKET (1 oz of each type) $1
Stock bottles: 4 oz $1.50 1 lb. $4
Order from your dealer or write us for leaflet IMO—S
R. P. CARGILLE 118 Liberty St., New York 6, N. Y.

SUPPLIES AND EQUIPMENT

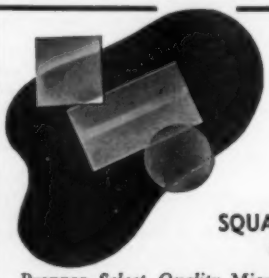
3 NEW MICROSCOPE ILLUMINATORS by LINDLY
foremost in MICROSCOPE LAMPS

Brilliant, adjustable, variable intensity illumination *all-purpose* lamps for laboratory, research and industry.
LINDLY & CO. 80 HERRICKS RD. MINEOLA, N. Y.

ANIMAL CAGES AND ACCESSORY EQUIPMENT
BUY DIRECT FROM MANUFACTURER
HOELTGE BROS., Inc.
1919 Gest St. Cincinnati 4, Ohio
Write for Illustrated Catalog

RATS 33¢
Albino & Hooded
F. G. Lurie, 834 E. 90th St.
Chicago 19, Ill.

MANOR FARMS STAATSBURG, NEW YORK
TEL. STAATSBURG 3278
Supplying every Research Need
Mice • Rats • Hamsters • Guinea Pigs • Rabbits • Cats • Dogs



PROPPER *Select Quality*
MICRO COVER GLASSES
SQUARES, RECTANGLES AND CIRCLES

Propper *Select Quality* Micro Cover Glasses are non-corrosive, non-fogging, and entirely free from flaws . . . meet or exceed *all* Federal specifications.

- Largest and most complete stock in the U. S. A.
- Special sizes of any dimension made to order
- Complete range of circles also available

Write for details, prices, and samples.

PROPPER MANUFACTURING CO., INC.
10-34 44th Drive, Long Island City 1, New York

The MARKET PLACE

BOOKS • SERVICES • SUPPLIES • EQUIPMENT

SUPPLIES AND EQUIPMENT

STAINS
STARKMAN Biological Laboratory
• RARE
• COMMON
Price list on Request
461 Bloor St., W.
Toronto, Canada

β-Glucuronidase
25,000 Fishman Units per gram* (in ammonium sulfate). Dry powder—stable at room temperature. Valuable in urinary ketosteroid assay.†

* Fishman, W. H., et al., J. B. C. **173**, 449 (1948).
† Corcoran, A. C., et al., J. Lab. & Clin. Med. **36**, 297 (1950).

Uricase
Dry stable preparation derived from kidney—more potent than available commercial uricase preparations. It is standardized, so that 5 mg. will catalyze the conversion of one micromole of uric acid to non-chromogenic end products in 90 minutes at 45° C°.

* Wolfson, W. Q., et al., J. Expt. Med. **92**, 121-27 (1950).

Also available—Cytochrome C, vials of 50 mg. (10cc).
Write for catalog listing other important biochemicals.
VIOBIN Laboratories • Monticello, Illinois

YOU reach over 32,000 scientists in these columns—at a very low cost

SUPPLIES AND EQUIPMENT

• HYPOPHYSECTOMIZED RATS
Shipped to all points via Air Express
For further information write
HORMONE ASSAY LABORATORIES, Inc. • 808 E. 58th St. Chicago 37, Ill.

All Amino Acids (natural, synthetic, unnatural), Rare Sugars, Biochemical Products, Reagents, New Pharmaceuticals in stock. Write or phone PLaza 7-8171 for complete price list.
BIOS LABORATORIES, INC. 17 West 60th Street, New York 23, N. Y.

For Conclusive Results Use
"VACSEAL" GUINEA PIG COMPLEMENT
CARWORTH FARMS, INC.
NEW YORK CITY, N. Y.

THE RICKETTSIAL DISEASES OF MAN

This symposium volume is a comprehensive survey of the general field of Rickettsial diseases in man. Among the contributors appear the names of many of the foremost American authorities on this important and relatively new field of medicine.

The first group of papers includes discussions of the taxonomy, biology, isolation, and identification of vectors, and reservoirs of infection of the Rickettsial diseases of man. The second group of papers is devoted to discussions of serological reactions, the Weil-Felix reaction, the complement-fixation and agglutination reactions, and the preparation and standardization of Rickettsial vaccines. The final group of papers treats of insecticides, methods of their application, and mite controls.

Many of the 27 contributors to this volume during World War II were on the battle fronts in Africa, Italy, France and Germany, protecting our troops and the local populations wherever Rickettsial diseases prevailed. Rarely, if ever, have the authors of a medical book had so wide and so successful practical experience in the very subjects on which they have written.

ORDER YOUR COPY *NOW*

To: A.A.A.S. Publications
1515 Massachusetts Avenue, N.W., Washington 5, D. C.

Please accept my order for one copy of *The Rickettsial Diseases of Man* (7¼ × 10¼, cloth bound). My check in correct payment is enclosed ($5.25 to A.A.A.S. members, $6.25 to those who are not members; including postage.)

Name .....
Address .....
City ..... Zone ..... State .....